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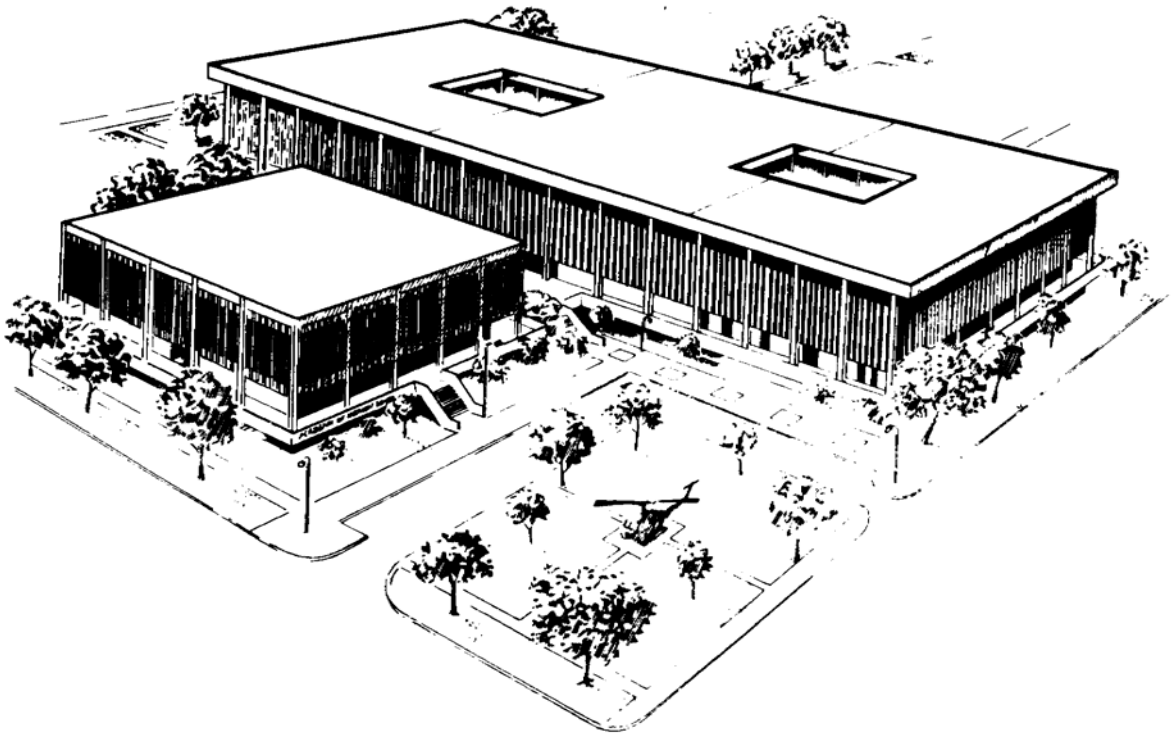
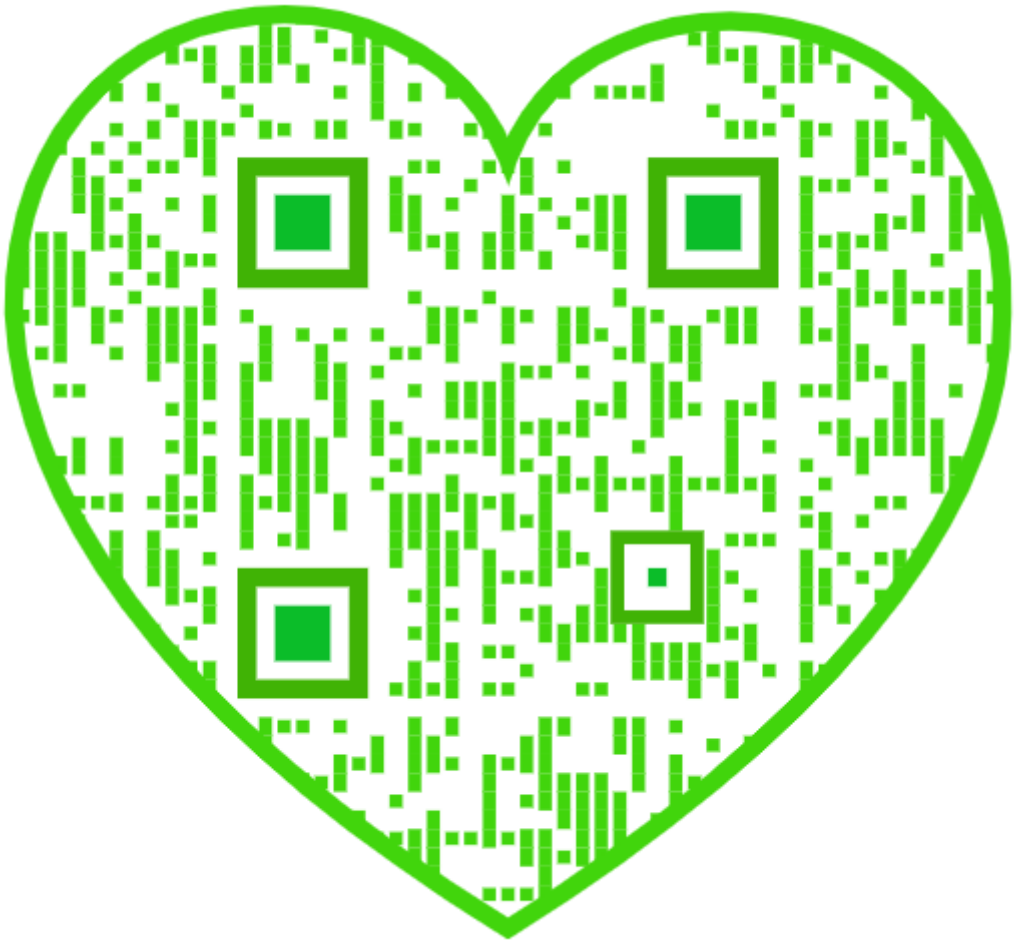


INTRODUCTION TO THE OPERATING ROOM

SUBCOURSE MD0923 EDITION 100



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CORRESPONDENCE COURSE OF THE
U.S. ARMY MEDICAL DEPARTMENT CENTER AND SCHOOL

SUBCOURSE MD0923

INTRODUCTION TO THE OPERATING ROOM

INTRODUCTION

A patient scheduled for surgery will have his operation performed by specilally trained personnel working in a highly specialized area of the hospital. This area--the operating room (OR) suite--has an environment suiited to its needs, but one quite different from that in the rest of the hospital. All activities in the OR suite are centered around the best possible care of the patient.

The purpose of this subcourse is to familiarize you with certain aspects of the OR environment that will provide you with a basis for understanding your role as an OR specialist and enable you to enhance the performance of duties assigned to you in the care of the patient.

Subcourse Components:

This subcourse consists of three lessons. The lessons are as follows:

Lesson 1, Orientation.
Lesson 2, Operating Room Personnel, Policies, and Nomenclature.
Lesson 3, Safety in the Operating Room.

Credit Awarded:

To receive credit hours, you must be officially enrolled and complete an examination furnished by the Nonresident Instruction Section at Fort Sam Houston, Texas. Upon successful completion of the examination for this subcourse, you will be awarded 10 credit hours.

You can enroll by going to the web site http://atrrs.army.mil and enrolling under "Self Development" (School Code 555).

A listing of correspondence courses and subcourses available through the Nonresident Instruction Section is found in Chapter 4 of DA Pamphlet 350-59, Army Correspondence Course Program Catalog. The DA PAM is available at the following website: http://www.usapa.army.mil/pdffiles/p350-59.pdf.

LESSON ASSIGNMENT

LESSON 1	Orientation.
LESSON ASSIGNMENT	Paragraphs 1-1 through 1-35.
LESSON OBJECTIVES	After completing this lesson, you should be able to:
	1-1. Identify the arrangement and nomenclature of equipment and furnishings in the operating room suite.
	1-2 Identify the principles of aseptic technique, including housekeeping procedures.
SUGGESTION	After completing the assignment, complete the exercises at the end of this lesson. These exercises will help you to achieve the lesson objectives.

LESSON 1

ORIENTATION

Section I. INTRODUCTION

1-1. SCOPE

This subcourse deals with various aspects of the operating room (OR) environment, focusing particularly on the physical environment, aseptic technique, surgical nomenclature, responsibilities of personnel, operating room team, ethics, certain policies, and safety measures. The OR specialist should have a full appreciation of these matters in order to understand departmental rules and policies and to know how his important role in the OR contributes to safe and effective patient care.

1-2. PURPOSE

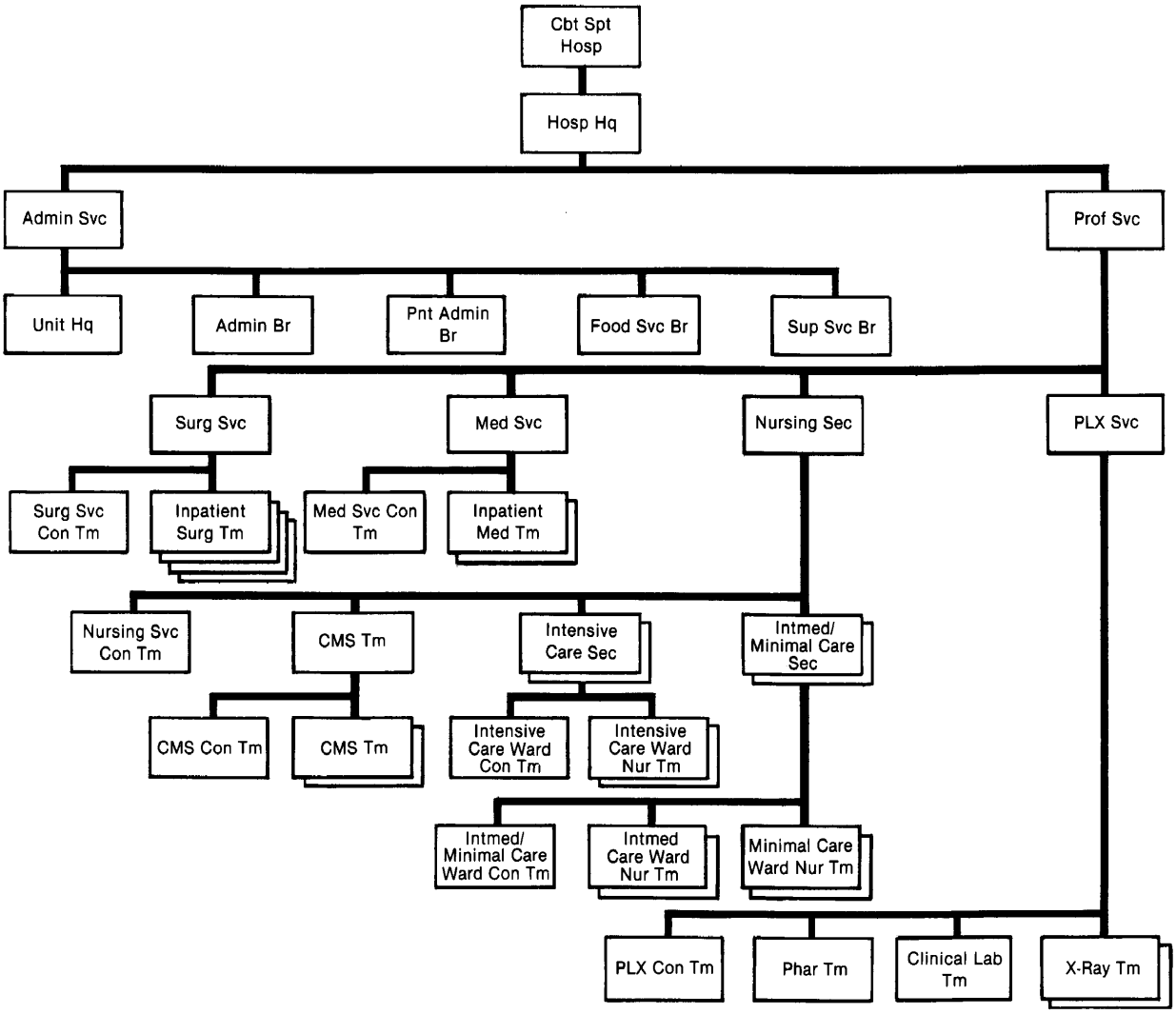
The purpose of this subcourse is to assist the OR specialist in gaining or renewing an understanding of the area in which he is assigned and an appreciation of the strict discipline under which members of the OR team work in their unceasing effort to render the best possible care to the patients entrusted to them. Accordingly, this text is directed toward the OR specialist.

1-3. APPLICATION OF MEDICAL PROCEDURES

An OR specialist may be assigned to any one of a variety of Army hospitals in the United States (US) or in a foreign country. The mobility of an Army hospital determines in part the amount of supplies and type of equipment it uses. This in turn may affect the manner in which the OR specialist applies various medical procedures.

NOTE: Mobility refers to the ability of a unit to move both personnel and equipment from one location to another, using its own transportation. A fixed unit is one that cannot change locations because the structures housing it are of a permanent type.

a. **Mobility.** Some Army hospitals are more mobile than others. For example, a combat support hospital (CSH) (see figures 1-1 and 1-2) utilizes medical unit self-contained transportable (MUST) equipment and modular structures. The basic CSH can be transported to a new location in four loads. On the other hand, a general hospital is fixed.



Admin	=	Administrative	Lab	=	Laboratory
Br	=	Branch	Med	=	Medical
Cbt	=	Combat	Nur	=	Nursing
CMS	=	Centralized Materiel Service	Pharm	=	Pharmacy
			PLX	=	Pharmacy, Laboratory, and X-Ray
Con	=	Control			
Hosp	=	Hospital	Sec	=	Section
HQ	=	Headquarters	Surg	=	Surgical
Intmed	=	Intermediate	Svc	=	Serv

Figure 1-1. Typical combat support hospital organization.

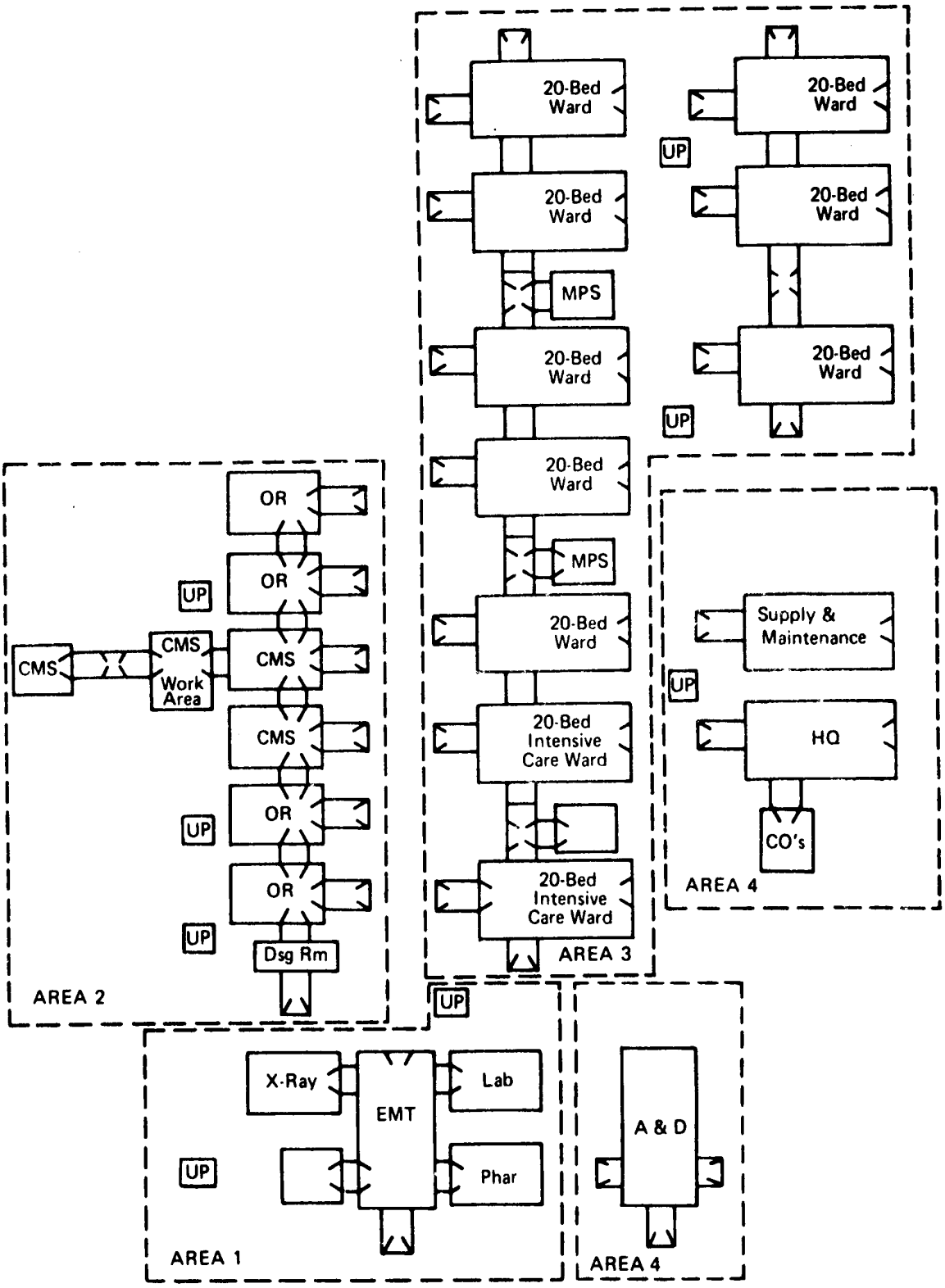


Figure 1-2. Typical layout of MUST components of a combat support hospital.

b. **Supplies and Equipment.** Fixed hospitals are capable of storing bulky and heavy supplies whereas mobile hospitals have a limited storage capacity. In addition, the equipment used in a CSH and many other mobile table of organization and equipment (TOE) medical units is characteristic of the compact, lightweight, and portable type, but it is usually quite similar in both appearance and operation to the equipment used in permanent (fixed) type hospitals.

c. **Guidance by Supervisor.** The OR specialist may find that a smaller variety of items, both supplies and equipment, are available in a mobile medical unit than in a fixed medical unit. This factor of having less supplies and equipment to work within certain hospitals indicates that the OR specialist may need to make adjustments in the method of performing some of his assigned duties. In some instances, he may need to improvise, as prescribed by his supervisor, in order to perform certain procedures. Furthermore, the type of improvisation required may vary from one hospital to another, depending upon the type of equipment that is available at a given time.

(1) Operating room supervisors and surgeons frequently prescribe the policy to be followed by personnel under their supervision.

(2) Therefore, in this and other subcourses related to the OR. specialist, principles and safeguards are stressed. Methods and techniques are discussed for the benefit of those specialists assigned to hospitals and other medical units where standing operating procedures (SOP) have not been developed or are incomplete.

Section II. THE OPERATING ROOM SUITE

1-4. DEFINITION

The use of the term "operating room" requires clarification. The entire area in which surgical operations are performed and materials are prepared and stored for surgery is properly called the operating room suite or the surgical suite. However, hospital personnel often describe the entire suite simply as the "operating room" (OR). Examples of such usage are: "OR specialist," "OR nurse," and "OR supervisor"--all of whom have duties throughout the surgical suite. Of course, "operating room" and "OR" are also used to indicate an individual OR in which surgery is performed. Throughout this subcourse, these terms "operating room suite" and "surgical suite" are used when referring to the entire area in which operations are performed and supplies are prepared and/or stored. Terms such as "OR specialist," "OR supervisor," and "OR personnel" are in general use and are understood by all hospital personnel as referring to persons assigned to the OR suite. The terms "operating room" and "individual operating room" are used to designate a room within the surgical suite where surgery is performed on a patient.

1-5. LOCATION

The surgical suite should be centrally located so that it is easily and quickly reached from all areas of the hospital, thus enabling personnel to transfer patients with the least possible delay. The suite should be situated near such support activities as X-ray, laboratory, centralized materiel service (CMS), pharmacy, and the recovery room (see figure 1-3). In addition, the suite should be located in a cul-de-sac (passage with only one outlet), or at least away from those areas of the hospital through which most of the traffic flows and should be sufficiently isolated to prevent annoyance, anxiety, and disturbance to other patients. Elevators should be easily reached for transportation of patients or supplies.

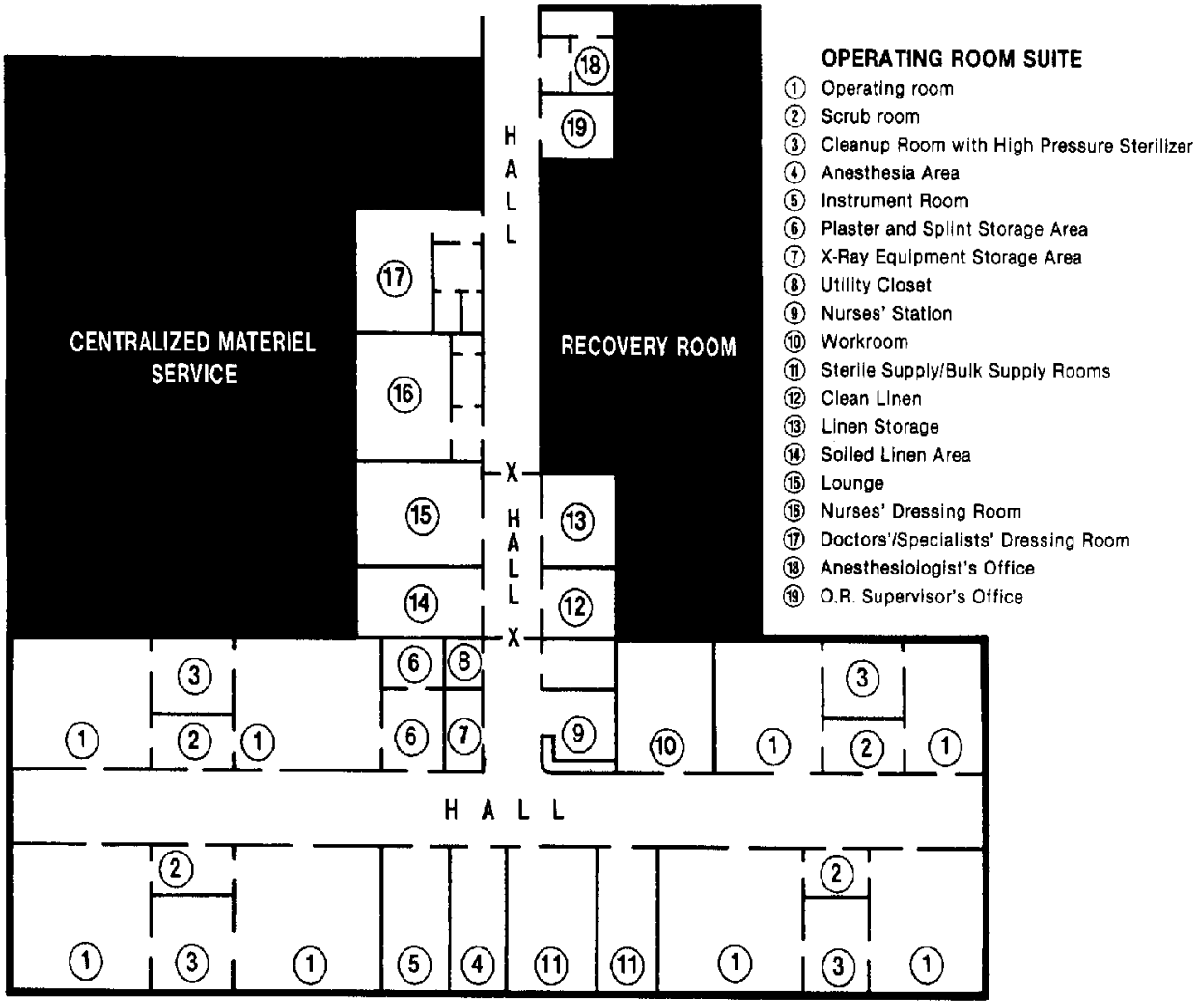


Figure 1-3. Type floor plan for an Army hospital operating suite.

1-6. PHYSICAL LAYOUT

a. **Arrangement.** Basic principles for efficient workflow are adhered to when planning the arrangement of rooms within a surgical suite. For example, traffic must move smoothly and without interruption into, through, and out of the suite. Those rooms where support activities are performed are grouped conveniently and systematically about the ORs, which are arranged in pairs with scrub rooms and sterilizing facilities between them. (See figure 1-3). Proper arrangement of the rooms reduces the flow of excess traffic, saves much unnecessary walking, and therefore conserves time and effort.

b. **Size of the Suite.** Numerous factors are considered when estimating the size of the surgical suite required for a hospital.

(1) The first of these is the operative load or the number of surgical cases to be done per day. Some hospitals have more patients requiring medical care than surgical care. In such a hospital, only a small operative section would be necessary. Several operative procedures can be done per day in each OR, one case following another, but all should be completed by the end of the usual day shift or shortly thereafter.

(a) The average number of ORs needed is indicated by the number of operative cases to be done daily divided by the number of cases that can be done daily in one OR.

(b) Operative load can also be broadly interpreted to include the amount of work to be done per day, outside of actual cases. There is a great deal of preparatory work necessary for each surgical procedure as well as the routine tasks to maintain the suite. If most supplies are prepared and sterilized in CMS, the OR suite needs to maintain only a small preparation and sterilization area; otherwise, it may need a large one.

(2) The second factor, the types of surgery to be done, is even more specific. Some procedures such as cardiac surgery are very long and detailed, requiring many hours of operative time; others, such as tonsillectomy, can be accomplished in just 20 to 30 minutes. In the first instance, a single OR would be engaged for the whole operative day with just one case; in the second example, eight or ten such procedures could be done in the same length of time.

(3) The number and frequency of emergency cases are also considerations related to the necessary size of the suite. The larger the troop area near a hospital, the greater the number of accident and emergency cases that may have to be done. These must be done immediately, meaning that other scheduled cases may have to wait until after normal duty hours, unless provision has been made for an additional room.

c. **Size of Individual Operating Room.** In addition to plans for the number of ORs required, the size of each room must also be considered. Certain types of surgery require the use of much bulky equipment. This is especially true of open-heart surgery, during which large machines are required to pump and oxygenate the blood outside of the body and to monitor the functioning of the heart. Factors such as this must be planned for and sufficient floor space provided so that breaks in aseptic technique due to overcrowding will be avoided. On the other hand, rooms should be no larger than necessary, thus reducing the amount of unnecessary times spent walking. The Army criteria for square footage per room are sufficiently flexible to provide for the needs of its hospitals. (See figure 1-3, "Type" floor plan for an Army hospital-operating suite.)

d. **Four Areas.** The designations listed in the Four Zone Concept (1) thru (4) are not necessarily used for all hospitals, but whenever feasible the surgical suite is segregated into four areas for traffic control. The purpose of such control is to assure maximum protection against infections. In analyzing the traffic and commerce system of the OR system, specific traffic patterns must be determined. These are dependent on the entrances and exits for both personnel and materials. Renovation planning of existing facilities should consider renovation of central supply and storage areas to bring these as close to the point of utilization as possible. Where entirely new wings, buildings, or entire hospital complexes are being considered, there is opportunity to design traffic, materials-handling, and storage systems around the requirements of the surgical suite. Traffic control design is aided by designation of the four-zone concept (as shown below): the interchange area, semirestricted area, restricted area, and dirty area.

INTERCHANGE	SEMI-RESTRICTED	RESTRICTED	DIRTY
Patient reception	Induction rooms	Operating rooms	Disposal Area
Locker rooms	Clean storage rooms	Sterile supply storage areas	
Lounges	Scrub areas		
Offices	Recovery rooms		

Four-zone concept.

(1) Interchange area. The interchange area is provided to enable persons from outside the surgical suite to meet with personnel within the suite when necessary. Examples of such rooms are the offices--one for the OR supervisor and one for the chief of anesthesiology (see figure 1-3 (18) and (19))--whenever the offices for these

personnel are situated within the surgical suite. In some hospitals, these offices are located convenient to but outside the surgical suite in order to keep traffic within the suite to a minimum. If there is a postanesthesia (recovery) room, it is also classified as an interchange area although entry is carefully controlled. The main outer corridors are in the interchange area. This area also consists of the rooms designed for personnel to change from street clothes or military uniforms into OR attire ("scrub clothing") (see figure 1-3 (15), (16), and (17)). If space and arrangement permit, there are two doors to each dressing room--one for the entry of persons in street clothes and the other for their exit in scrub clothes. The individual lockers are generally equipped with nametags, locks, and keys. Caps, masks, and scrub clothing are stored in the dressing rooms. Dressing rooms may be equipped with showers. A mask need not be worn in this area.

(2) Semirestricted area. Comprising the semirestricted area are corridors within the work area, the anesthesia workroom and storage, the utility closet, the instrument storage room, the workroom, the linen storage room, the clean linen room, and the soiled linen room (see figure 1-3 (4), (5), (7), (8), (10), (11), (12), (13), and (14)). The semirestricted area then represents the supply center for the surgical suite. Although, non-sterile procedures are performed in this area, personnel without OR attire are not admitted. A mask need not be worn in this area.

(3) Restricted area. The restricted area consists of all rooms in which sterile procedures are done and sterile goods are opened or exposed. This includes the individual ORs and the adjacent scrub rooms (see figure 1-3) where soap, nail files, brushes, timers, and written directions are available for the scrub procedure. Also included are the preanesthesia rooms (induction rooms) if the suite has this facility. On the floor plan shown in figure 1-3, a part of the "anesthesia area," (4), may be designated for the induction of anesthesia. If the suite is arranged to include a substerilizing room between each two ORs (see figure 1-3 (3)), then these rooms are considered to be restricted because supplies are autoclaved here without being covered and are moved, uncovered, into the OR. Each person working in the restricted area is required to wear scrub clothes, cap, and mask.

(4) Dirty area. The dirty area is the disposal area, where all utilized materials and linen are gathered, packaged, and sent to appropriate areas.

e. **Arrangement of Areas.** There is no one rule that must be followed in the physical arrangement of the four areas previously discussed. However, the nonrestricted and interchange areas should be located near the entry door. Workroom areas are situated near the center of the suite, and storage and supply rooms nearby are positioned to avoid waste in time and energy of personnel. Areas for storage of both sterile and unsterile supplies must be clearly marked to avoid mistaking one for the

other. If there is no linen chute in the suite, a room for soiled linen is necessary (see figures 1-3 (14)). This room is classified as semirestricted. If the suite has observation galleries, these are provided with outside entries to eliminate unnecessary traffic of persons in street clothing.

1-7. CONSTRUCTION

a. **Discussion.** Construction of the individual ORs is important because each room should provide an ideal area for the performance of surgery. In addition, proper construction makes provision for the maximum efficiency of personnel and for the safety of both patients and OR personnel. Proper construction and size are also related directly to ease of cleaning and the maintenance of aseptic technique.

b. **Floors.** Floors should be smooth, wear-resistant, and nonporous. Suitable materials include ceramic tile, terrazzo, or vinyl plastic approved for installation in the OR by the National Fire Protection Association. Edges and corners at the juncture of floor and walls are rounded to prevent the accumulation of dust and facilitate cleaning. The ceramic tile or other material used for construction of floors is impregnated with a conductive material and is rounded. The purpose of this type of flooring is to provide a path, which will conduct electricity away from all persons and equipment making contact with the floor, thus preventing the accumulation of dangerous electrostatic charges. Conductive flooring for special application rooms is not required where inflammable anesthetic gases are prohibited and where a high degree of monitoring is required.

c. **Walls.** Walls no longer have to be tiled. The plaster between the tiles is porous and can harbor bacteria. New paneling materials and flexible wall coverings, along with new adhesives, permit completely sealed wall, ceiling, and floor joints so that these surfaces may be washed with all types of bactericidal chemical solutions. However, the walls may be covered completely with nonglare tile. If tiled, the tile should reach at least six feet up from the floor for easy wet-cleaning and scrubbing. The upper portions of the walls are painted with a washable pastel paint the color of the tile.

d. **Ceilings.** Ceilings are often smooth, washable, and soundproofed. They are often painted the same or similar color as the walls. White is no longer used since colors lessen the glaring reflection of light in the eyes.

e. **Cabinets.** Cabinet can be provided for the storage of sutures, medications, infusion sets, and other supplies. If recessed into the walls and provided with sliding doors, these cabinets conserve working space and interfere less with the maintenance of aseptic technique. Cabinets should be in a well-lighted area of the room and should be easily accessible to the circulator who will be required to furnish supplies from them during the operative procedure (see figure 1-4).

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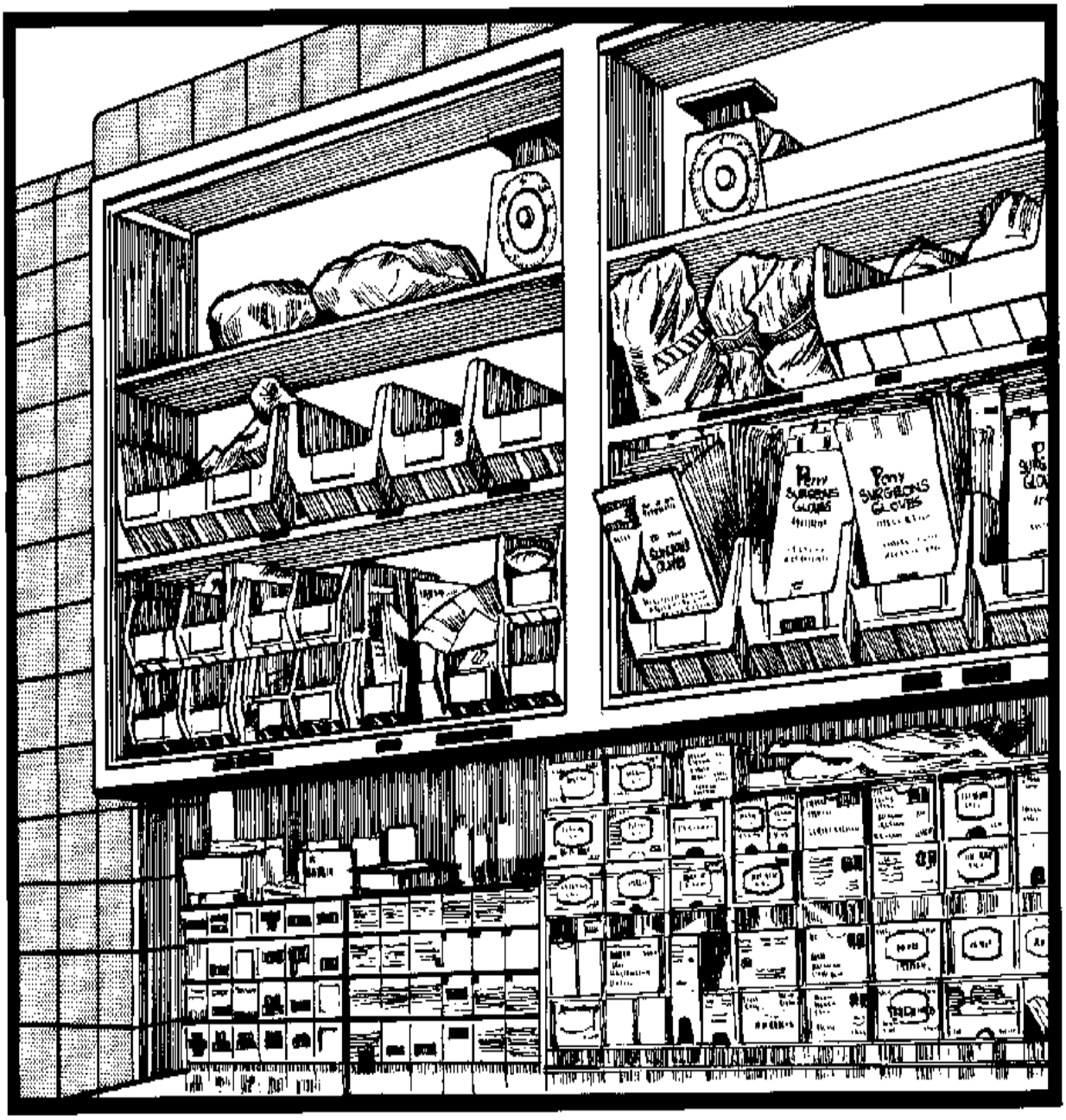


Figure 1-4. Cabinet in an operating room.

f. **Doors.** Doors may be of several types. All doorframes should be a minimum of five feet in width. One type of door is the "double acting" (swinging) type with rubberized door guards on each side. These doors should be equipped with a window for easy visualization from both sides (see figure 1-5). A second type is a door, which swings outward. Swinging doors produce air turbulence, which increases bacteria count. However, minimum use of swinging doors is advised

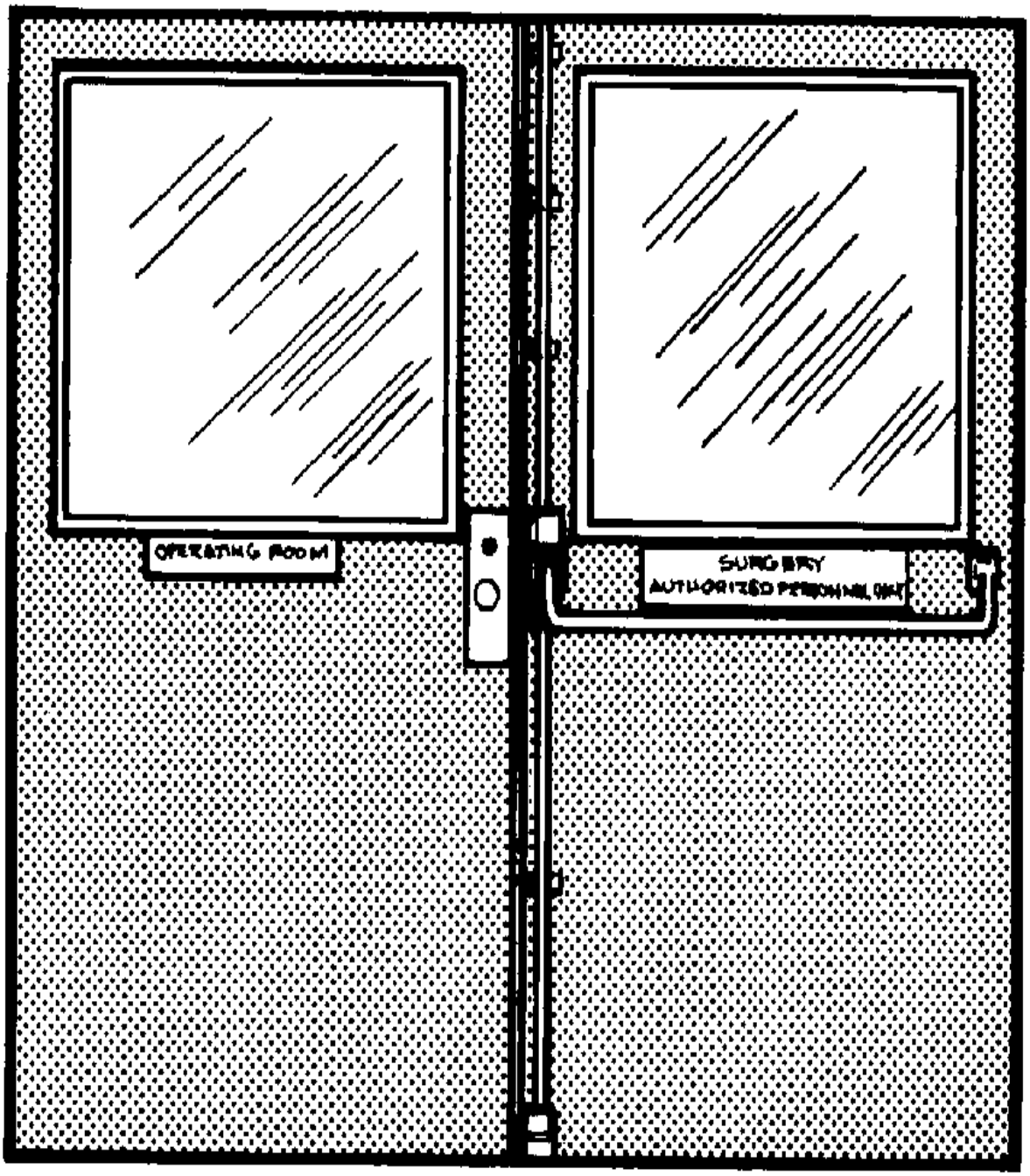


Figure 1-5. Swinging doors.

g. **Signal Light.** Each room should be equipped with an emergency signal light or call button that can be operated conveniently by the anesthetist or circulator.

NOTE: In this subcourse, references to the "scrub" and "circulator" pertain to certain duties performed by the OR specialist. (Refer to lesson 2, paragraph 2-18.)

h. **Special Surgical Needs.** The Surgical Specialties require consideration of special needs. For example, flush-mounted snap-lock water connections for the heart-lung machine, X-ray facilities, space for neurocryosurgery, and special outlets for air-powered equipment may be required. SomeSpecialties use fiber optics, a laser apparatus, special built-in television, or cine cameras. Each service is consulted for any anticipated special needs that will require preparation, operation, or maintenance by the nursing service.

1-8. LIGHTING

a. Ordinary lighting for the OR is adequately provided by fixtures recessed into the ceilings. To provide additional light over the operative area, there is a special overhead light fixture (see figure 1-6) suspended from the ceiling. This fixture is designed to provide shadow-free lighting on the operative area, to give off a minimum amount of heat, and to be easily cleaned and adjusted. The specialist should practice adjusting this light so that he can make changes quickly and accurately during surgery. The ceiling lights and the operating lights are on different circuits to avoid confusion and delay if a fuse burns out.

Figure 1-6. Operating room lights.

b. Portable lights are necessary for satisfactory illumination in some operative procedures such as vaginal or rectal surgery. Storage battery lights should be provided for emergency lighting during a power failure. These must be inspected, tested, and recharged at frequent intervals, as prescribed by local policy.

1-9. ELECTRICAL FIXTURES

a. **Discussion.** In rooms where explosion hazards exist, circuits supplying electrical current for lighting and for wall outlets are all grounded to a common ground to prevent arcs and sparks and to reduce the possibility of electrical shocks to personnel.

b. **Outlets.** Explosion-proof outlets for mobile equipment are located in the walls about one foot from the floor and also near the operating table. The alternating current (AC) and direct current (DC) outlets are clearly marked by color and shape to prevent plugging a piece of electrical apparatus into the wrong current. These wall outlets have interlocking switches so that a plug cannot be withdrawn or inserted while a plug is securely inserted into the outlet. The current is broken into an explosion-proof enclosure before the plug is removed. Outlets and switches, which are not explosion-proof are mounted five feet above the floor, in areas where flammable anesthetic agents are administered to patients, because the area is considered to be hazardous up to that level. In some surgical suites, even those outlets that are nonexplosion-proof are mounted five feet from the floor.

c. **Extension Cords.** Extension cords that are not explosion-proof are never to be used to connect mobile equipment to wall outlets because such cords are hazardous. The foot control pieces for mobile electrical equipment are insulated as a precaution against explosion.

d. **Other Fixtures.** Other items of electrical equipment usually included are vapor-proof X-ray view boxes built directly into the wall and an explosion-proof electric wall clock with a sweep second hand.

(1) Operating room suites of the future will be designed to facilitate the use of computers in the monitoring of patients, in obtaining diagnostic data and calculations, and in the ordering of supplies. Hospital designers may plan for computer terminals to be directly accessible to specially trained individuals who can interpret the data in the OR.

(2) All cabinets, view boxes, and receptacles should be recessed. Wall-mounted shelves and mounted cabinets, and freestanding storage cabinets are being used less and less because of difficulty in cleaning and maintaining supplies.

(3) The current trend is toward the cart system where mobile units are constantly supplied and cleaned.

(4) No windows should be installed.

1-10. TEMPERATURE, HUMIDITY, AND AIR CIRCULATION

Ventilation should be furnished by an air-conditioning system whenever possible. Hence, it should be relatively easy to provide a regulated temperature of 72ºF to 78ºF. Humidity should be maintained between 55 and 60 percent to lessen the explosion hazard when flammable anesthetic agents are administered. Air conditioning also assists in the elimination of foreign particles by providing freshly filtered air free of dust.

Section III. FURNITURE AND EQUIPMENT

1-11. INTRODUCTION

a. **Discussion.** The types of equipment and its arrangement will vary in different installations according to individual needs and preferences. Adequate but not excessive equipment should be available and arranged so that maximum efficiency is obtained with minimum effort. Modern OR equipment with but few exceptions is made of unpainted, durable, and easily cleaned corrosion-resistant metal (CRM). In addition, most of the items are equipped with casters to enable them to be moved quietly and with the least possible effort. The casters are made of conductive material--either metal or conductive rubber--for the same reason that floors are conductive (refer to paragraph 1-7b).

b. **Illustrations.** Many of the figures in this lesson show equipment used in Army hospital ORs. Equipment for use in the field is similar to that shown, except that bulky items for field use are characteristically constructed to permit knockdown (refer to paragraph 1-3b). The equipment shown in this lesson is that which is typically used during surgery. This type of equipment is considered standard items and is listed in the Federal Supply Catalog. A cardioscope, which is not shown, is used only for special kinds of surgery and will be purchased through normal channels. Any item not listed in the Federal Supply Catalog is nonstandard, if needed, and must be obtained through a local purchase request.

1-12. OPERATING TABLE

There are several types of operating tables (see figure 1-7) in use and all are rather complicated in construction and manipulation. They are designed so that they can be adjusted to the needs of the surgeon for any type of operation he may perform. The table is equipped with a hydraulic system. It is mounted on casters that are locked in place during surgery. The operating table shown in figure 1-7 is "dressed" or made up with sheets ready to receive a patient.

The enlisted 0R specialist assigned to circulate for an operation is responsible for assisting with the positioning of the patient. Therefore, he must have a detailed knowledge of the table as well as the many positions of the patient for surgery. A full discussion of the operating table, attachments, and use are set forth in Subcourse MD0927, Special Surgical Procedures I.

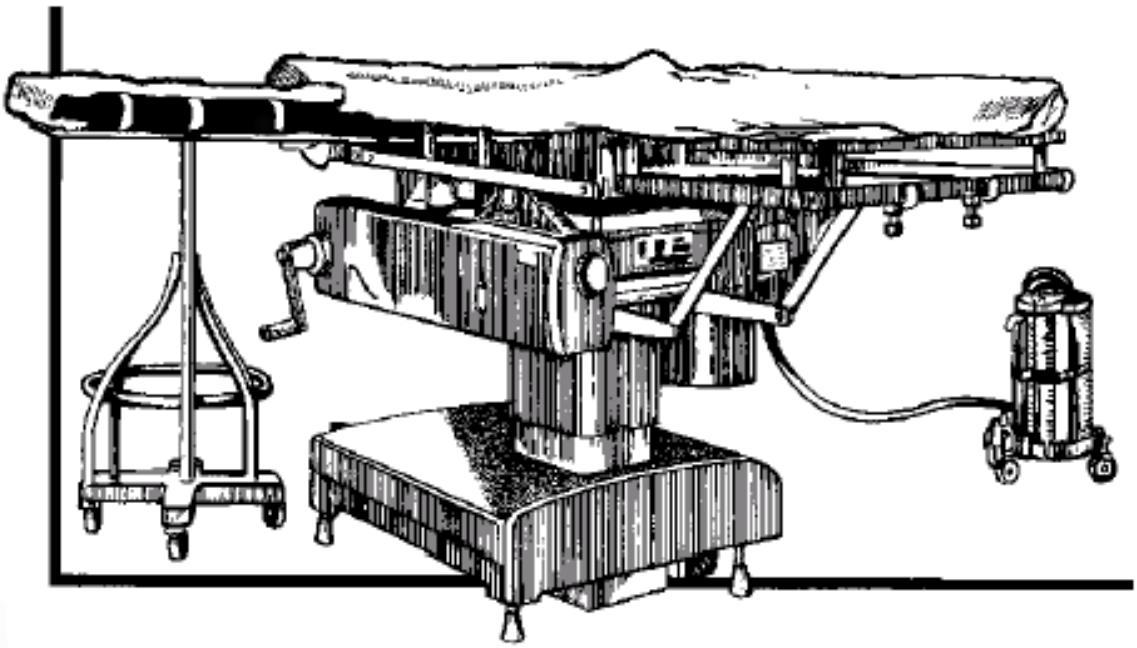


Figure 1-7. Operating table.

1-13. SURGICAL INSTRUMENT TABLES

a. **Mayo Stand**. See figures 1-8, 1-11, and 1-12. This stand or table is small, and its height is adjustable. It is designed to overhang the operating table and hold instruments and other sterile items for immediate use and within easy reach of the scrub. The tray upon which the sterile goods are placed is detachable so that is may be sterilized for use during an operation.

b. **Large Tables for Instruments.** See figures 1-9, 1-10, 1-11, 1-12, and 1-13). The largest table for instruments used in the OR is the angular or "L"- shaped table. The table provides an area where additional sterile supplies for the case can be arranged and stored until needed. If the number of supplies to be used does not require the use of the angular table, a smaller rectangular table is used. Both the angular table and the smaller rectangular table are often referred to as "back" tables. The "back" table is placed within easy reach of the scrub and is draped with sterile drapes for use during an operation. (See Figure 1-10.) There is also an undraped angular instrument table (back table).

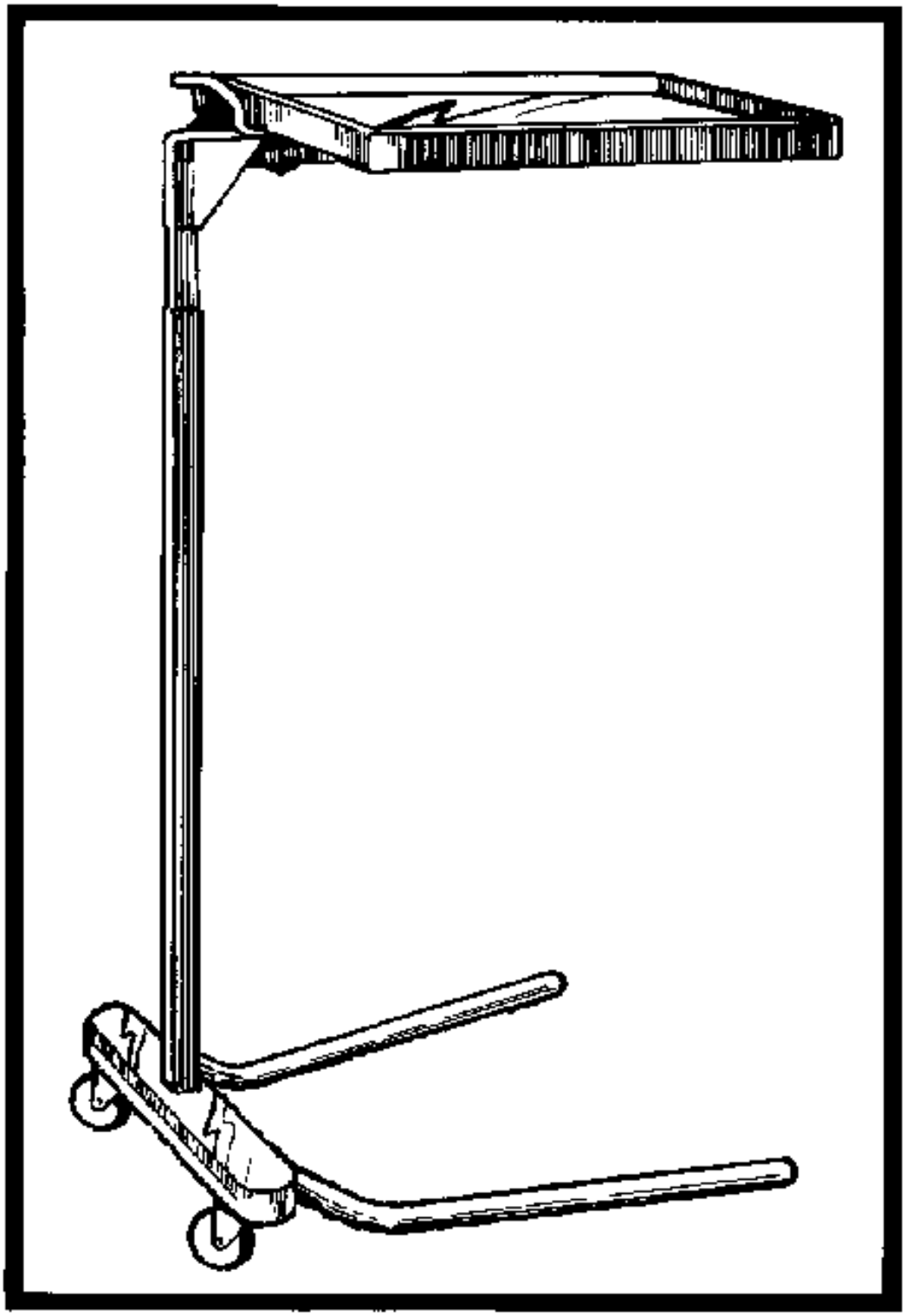


Figure 1-8. Mayo stand with detachable tray.

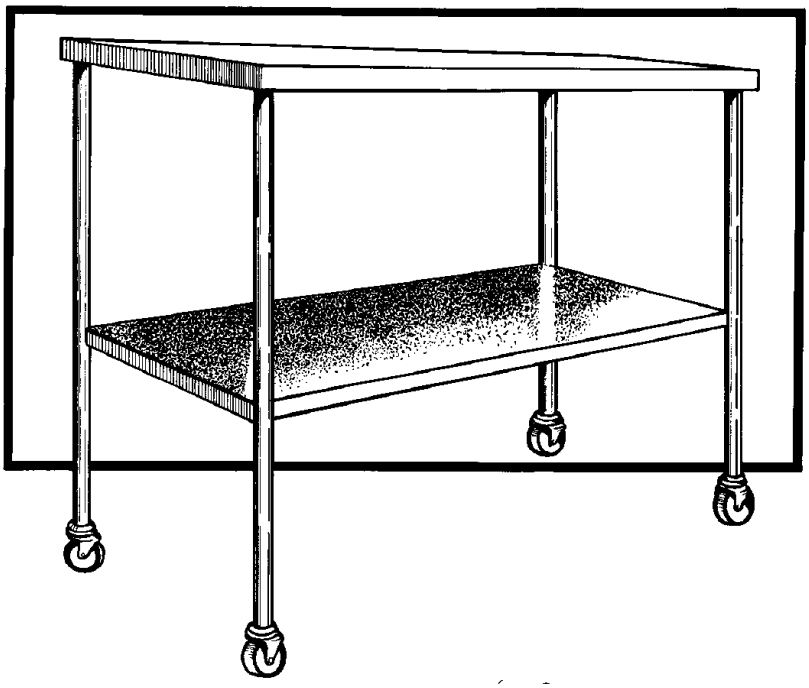


Figure 1-9. Large instrument table (back table).

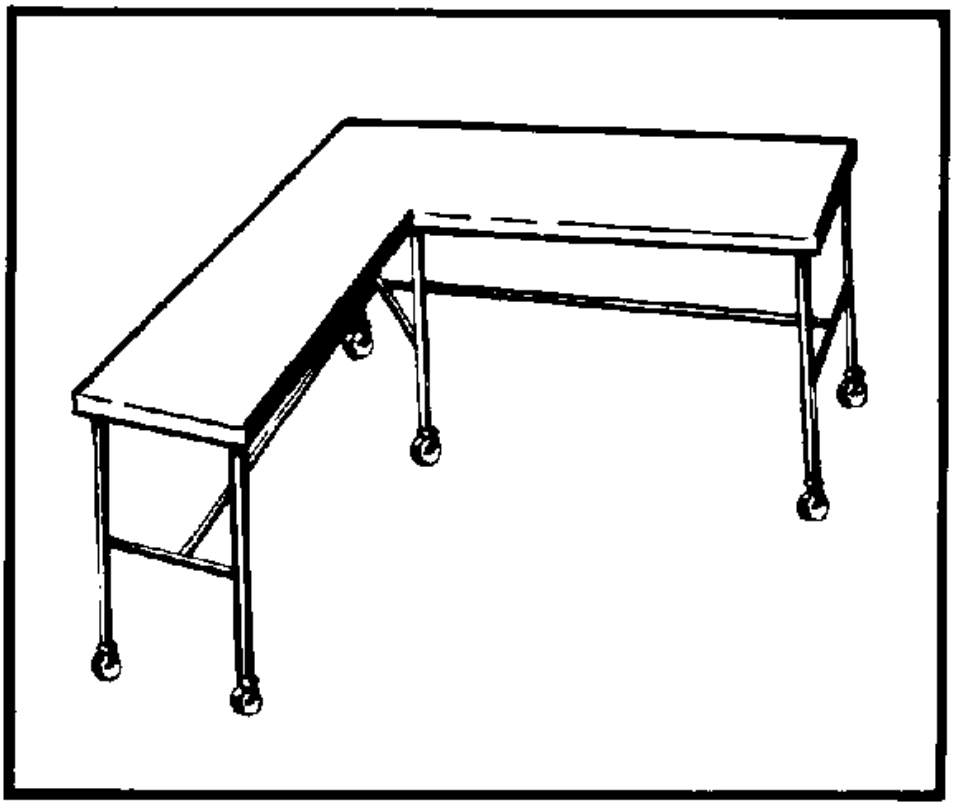


Figure 1-10. Undraped angular instrument table (back table).

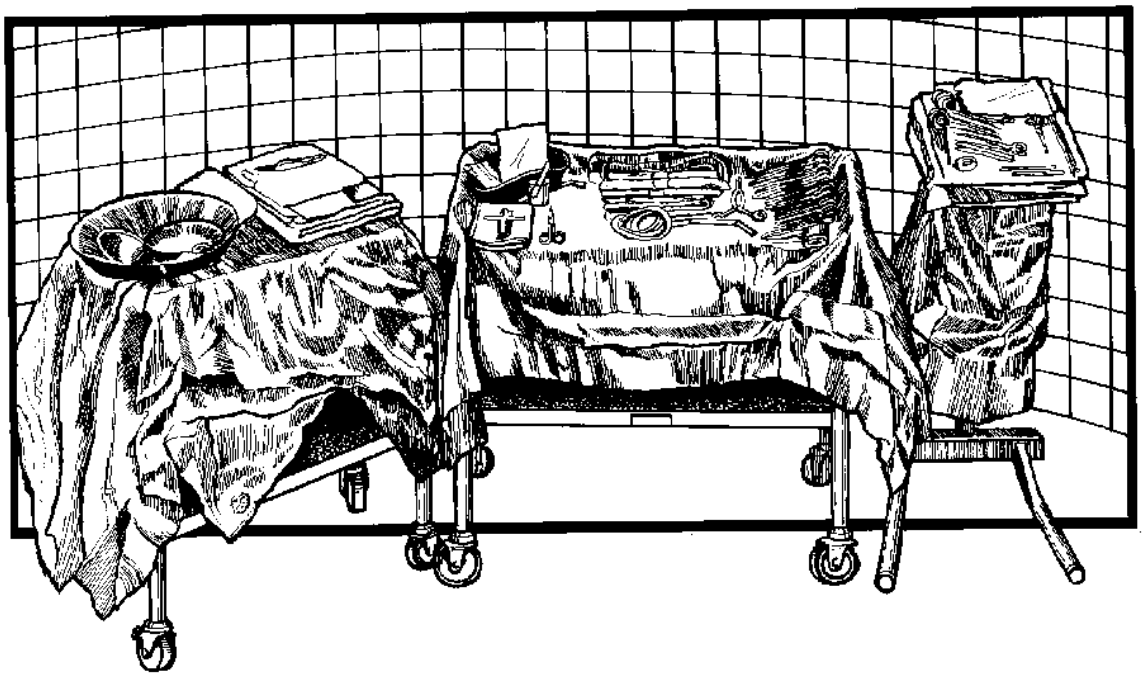


Figure 1-11. Sterile set-up (equipment set-up for surgery).

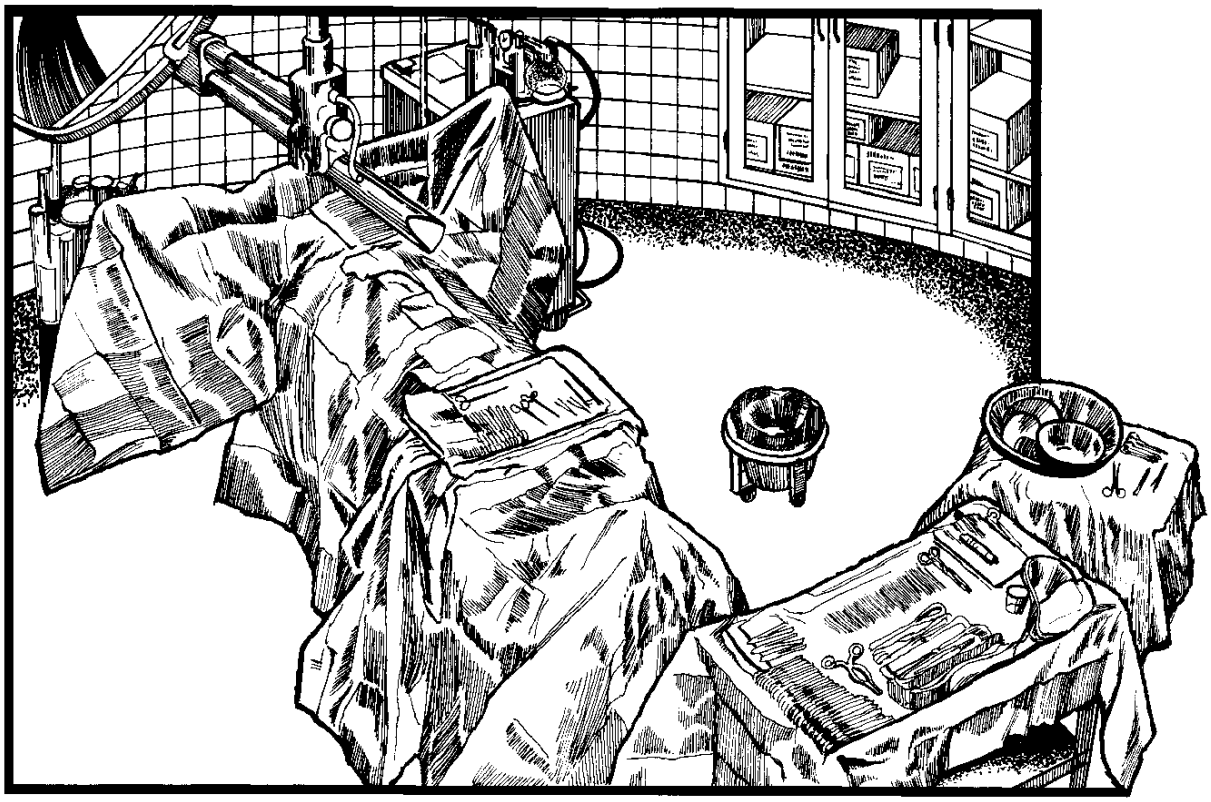


Figure 1-12. Sterile equipment in position.

c. **Table for Skin Preparation ("Prep") Setup.** Some type of a small instrument table is necessary for setting up a sterile field containing the materials needed to cleanse or prep the patient's skin for surgery. Refer to figure 1-13.

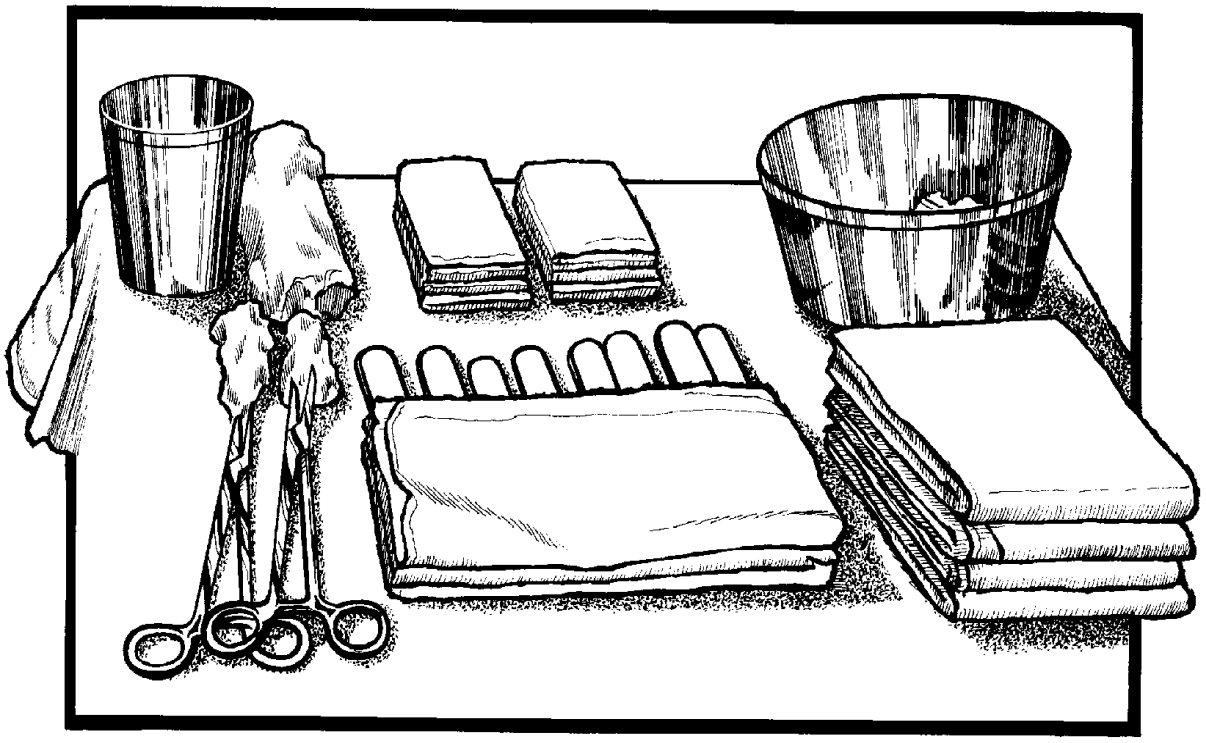


Figure 1-13. Table containing sterile prep supplies.

d. **Additional Tables**. Depending upon the type of surgery to be performed, shelved instrument tables or small accessory tables may be needed in an OR in addition to those described in the previous paragraphs. For example, in ORs without recessed wall cabinets or in those with inadequate wall cabinet space, a small instrument table with shelves is used to hold the sutures, solutions, and medications that may be required during an operation.

1-14. ANESTHETIST'S EQUIPMENT

The anesthetist's equipment is grouped together in the setting in figure 1-14.

a. **Discussion.** The items of equipment discussed below are cleaned and maintained by Anesthesiology Services personnel.

b. **Gas Anesthesia Apparatus.** (See figures 1-15 and 1-16). This is a mobile piece of equipment constructed to hold the following anesthetic materials.

(1) Pressure regulators for both oxygen and nitrous oxide.

(2) Inhaler tubes.

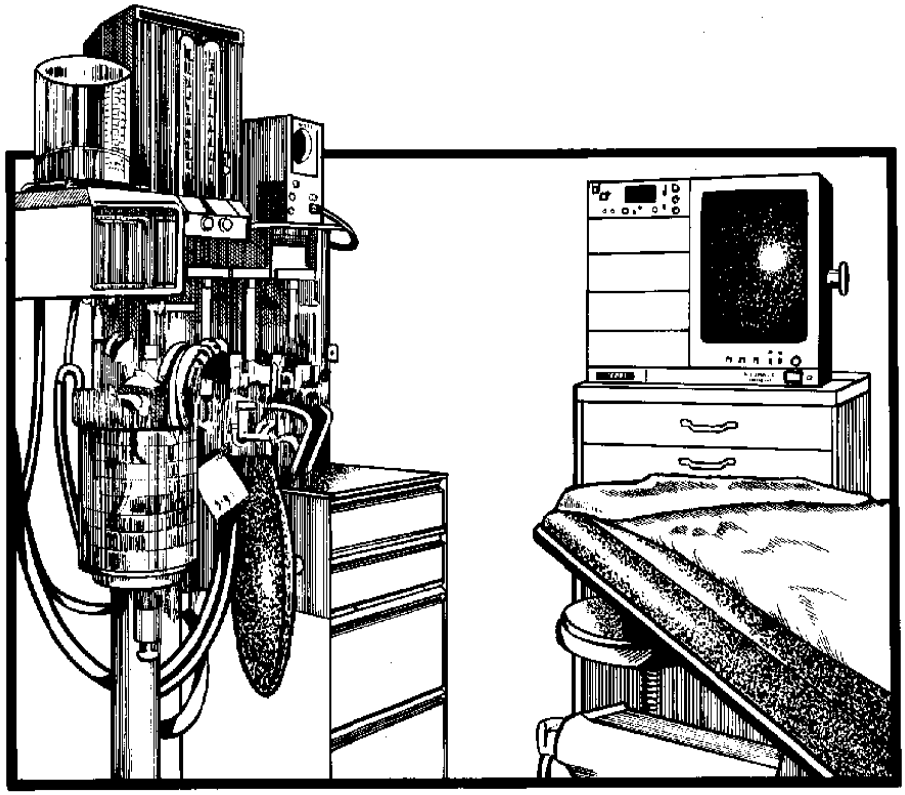


Figure 1-14. The anesthetist's equipment.

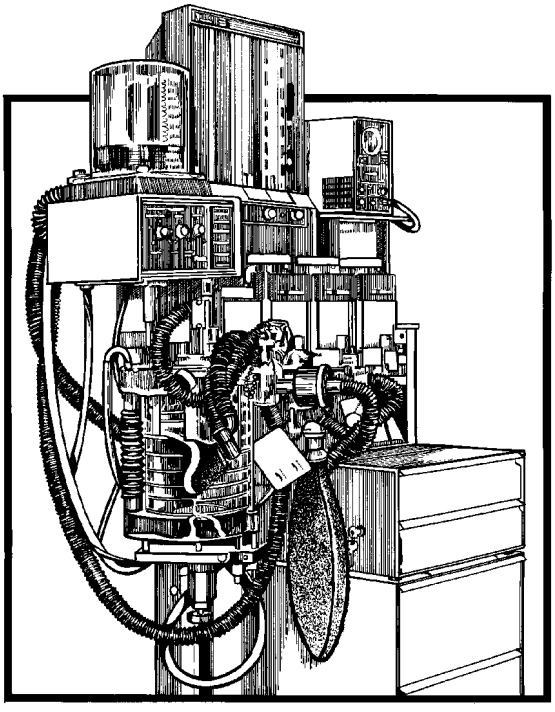


Figure 1-15. Anesthesia machine.

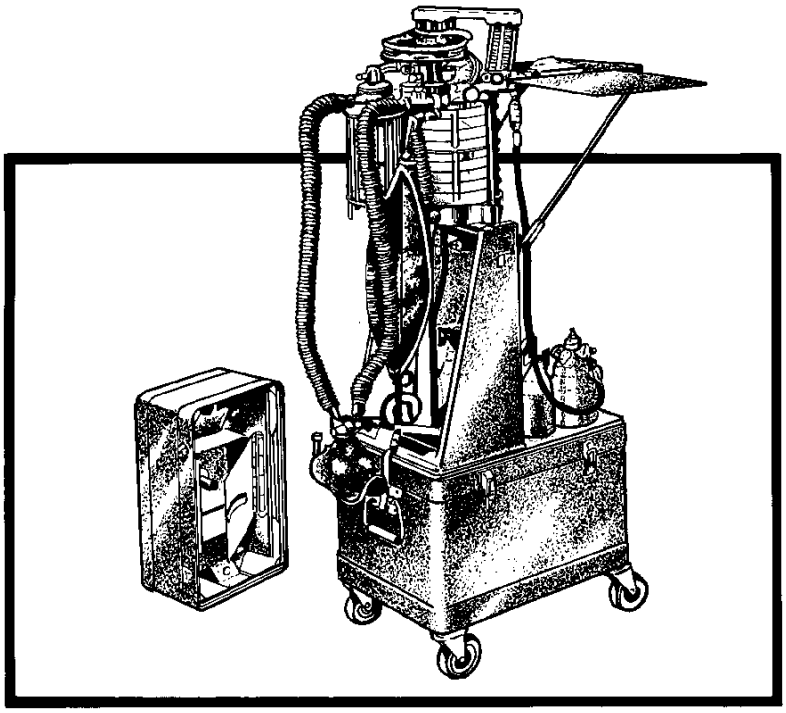


Figure 1-16. Anesthesia machine (field type).

(3) Oronasal mask.

(4) Rebreathing bag.

(5) Water manometer (indicates the rate of flow of gases).

(6) Carbon dioxide absorber unit.

(7) Tanks of oxygen and nitrous oxide.

c. **Table**. The anesthetist's table is small and low and is used to hold all of the additional equipment necessary for the administration of anesthesia. See figure 1-16, Anesthesia machine (field type).

1-15. BASIN (RINGED) STANDS

Double- and single-ring stands (see figures 1-17 and 1-18) are designed to hold basins of sterile solutions used during the operative procedure. A single-ring stand may be used to open instruments sets, and so forth. A double-ring stand is placed near the scrub who uses one basin for rinsing instruments, and so forth, the other for moistening sponges. Basin stands are equipped with casters to allow them to be moved easily.

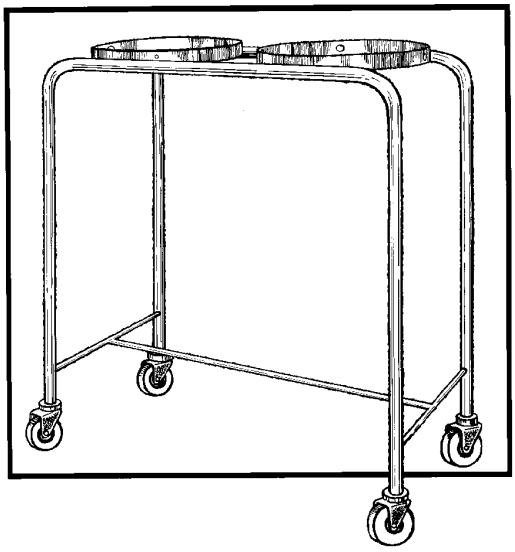


Figure 1-17. Double-ring stand.

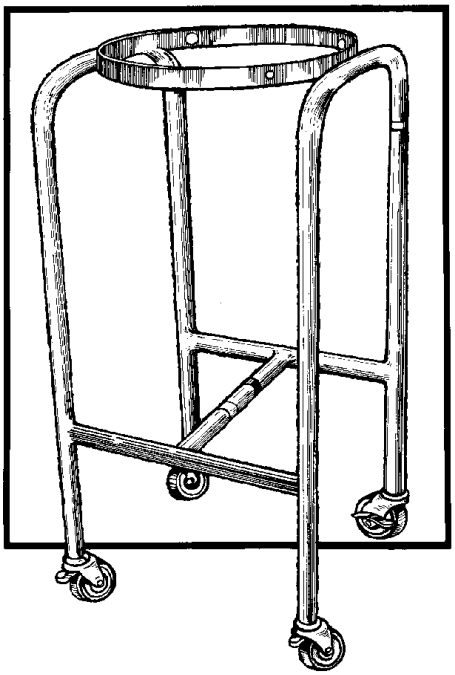


Figure 1-18. Single-ring stand.

1-16. KICK BUCKETS

A kick bucket (see figure 1-19) is a large pail placed in a carriage with wheels. A kick bucket is put on each side of the operating table to serve as a waste receptacle. Kick buckets are convenient to use, easy to clean, and are easily movable with the foot. For surgery, kick buckets should be lined with a nonstatic-producing plastic liner to receive soiled sponges and waste material; thus, gross soil is kept off the buckets.

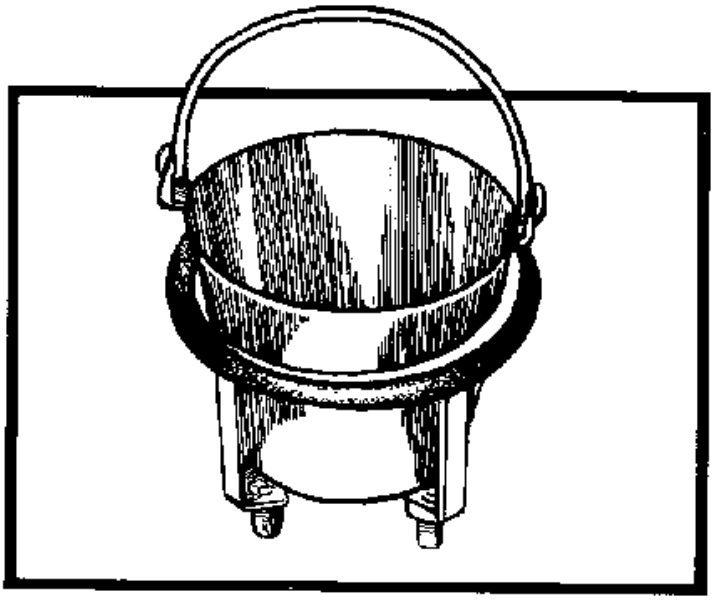


Figure 1-19. Kick bucket.

1-17. STOOLS

a. **Revolving Stools.** A revolving stool (refer to figure 1-14) is furnished for the anesthetist, who works in a sitting position. Another is provided for the surgeon if he is to sit during the operation, as he often does for vaginal and rectal operations. Note that the legs of the stool are equipped with rubber tips, assuring that the stool will remain where placed while a team member is sitting on it. These tips are made of conductive rubber.

b. **Straight Stool (Footstool).** See figure 1-20**.** These are small footstools, eight inches in height, constructed of metal with a rubber-covered top that may be used to increase the height of a team member. Note that these stools also have rubber-tipped (conductive rubber) legs to prevent them from moving while team members stand on them.

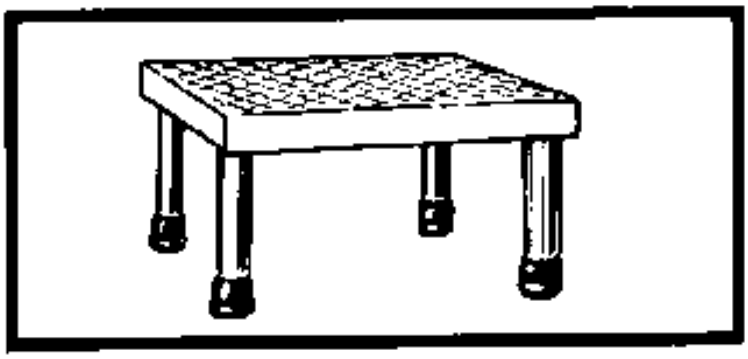


Figure 1-20. Straight stool (footstool).

1-18. INFUSION AND IRRIGATOR STAND (INTRAVENOUSLY INFUSION STAND)

The infusion and irrigator stand (see figure 1-21) is a mobile, adjustable-height stand from which containers of whole blood, intravenous solutions, or irrigating solutions are suspended. At least one stand per OR is needed for the administration of fluids. (See the stand in figure 1-14.) A second intravenously infusion (IV) stand should be available, as it may be needed to serve as an anchor point for the drape, thus separating the anesthetist from the sterile field. Figure 1-22 illustrates commercially prepared irrigating solutions and hospital prepared irrigating solutions.

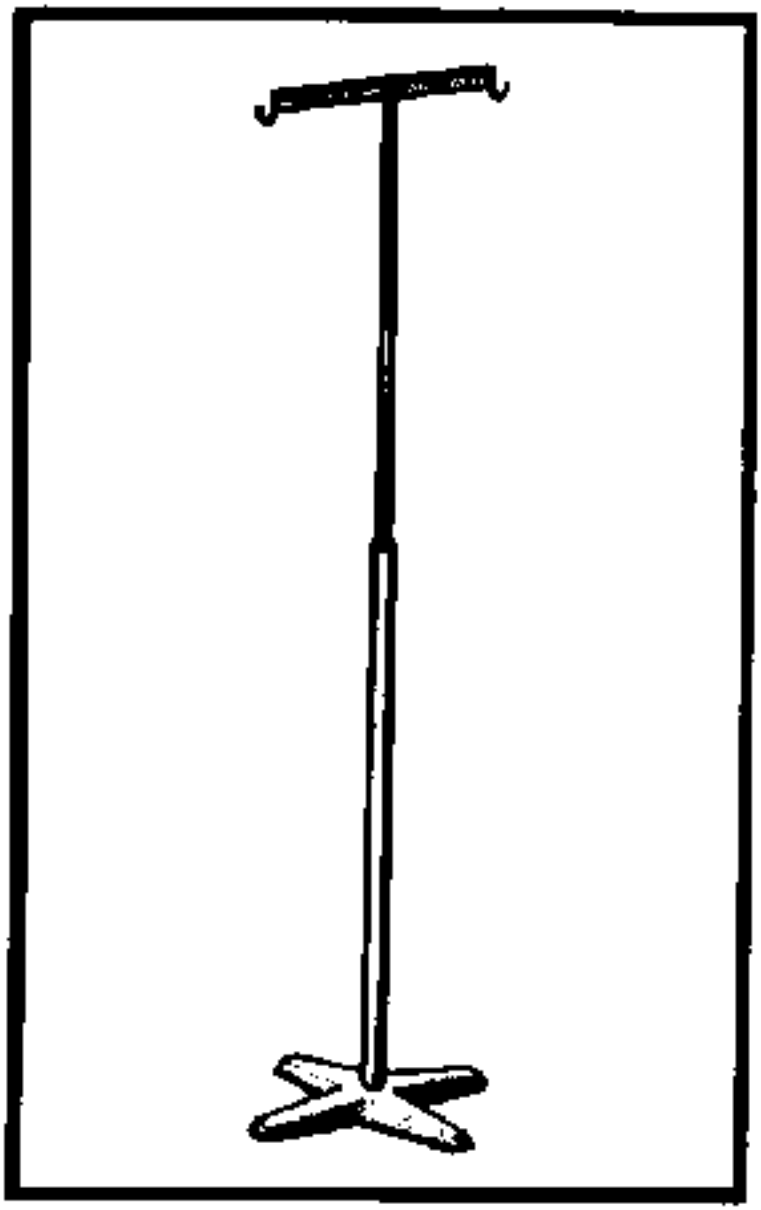
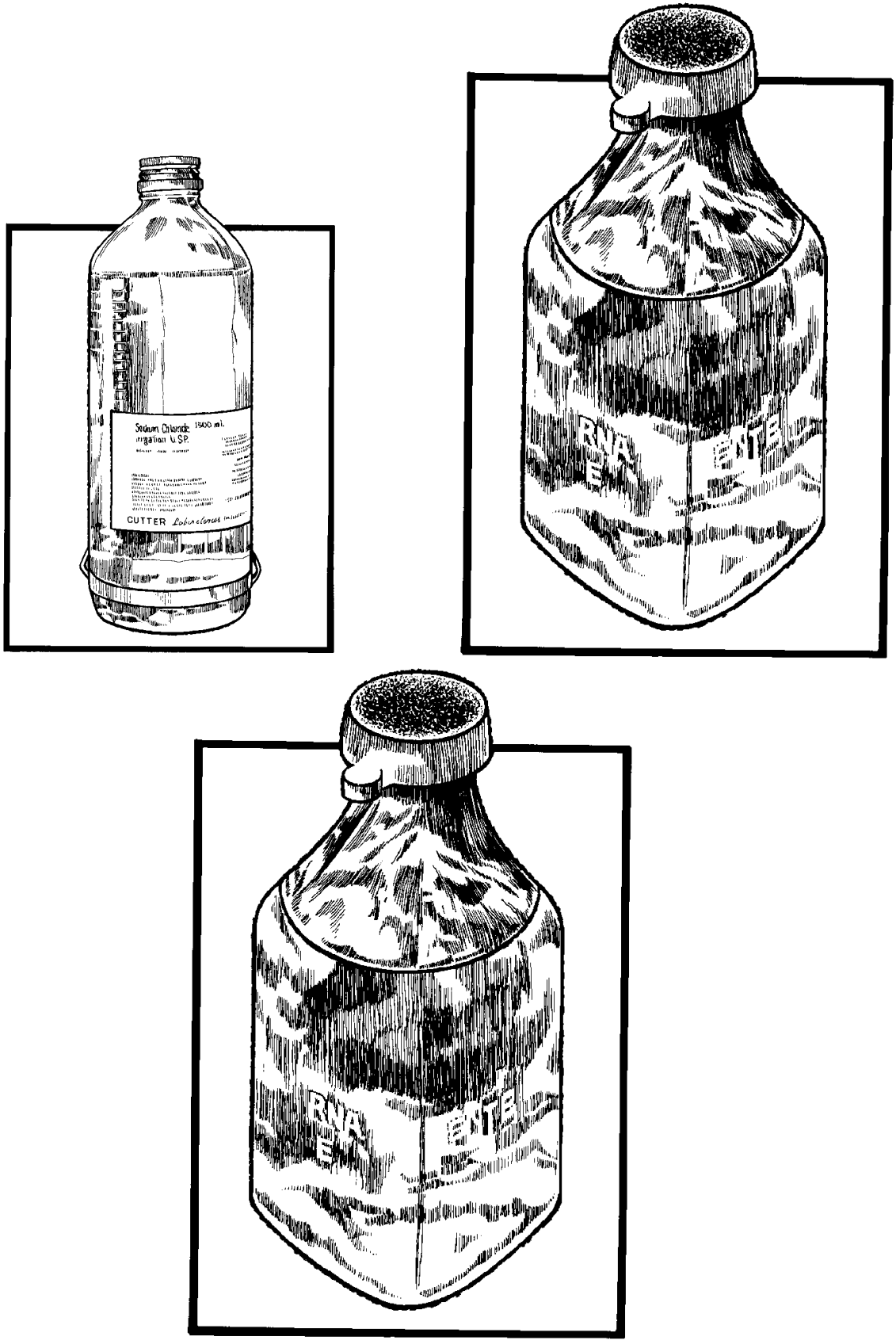


Figure 1-21. Infusion and irrigator stand.



Commercially Prepared Hospital Prepared

Figure 1-22. Irrigating solutions.

1-19. SUCTION APPARATUS

A suction apparatus (see figure. 1-23) is used to siphon blood and other fluids from the body cavities or areas in which the surgeon is operating. Another unit of this type with its attachments is used by the anesthetist. If in-wall suction is available, a suction container with tubing on a low-wheeled base is necessary. Equipment should be tested immediately before low-wheeled base is necessary. Equipment should be tested immediately before each operation. Containers for use with suction apparatus are calibrated so that the drainage can be measured accurately. Additional containers should be available in the room where the suction apparatus is being used.

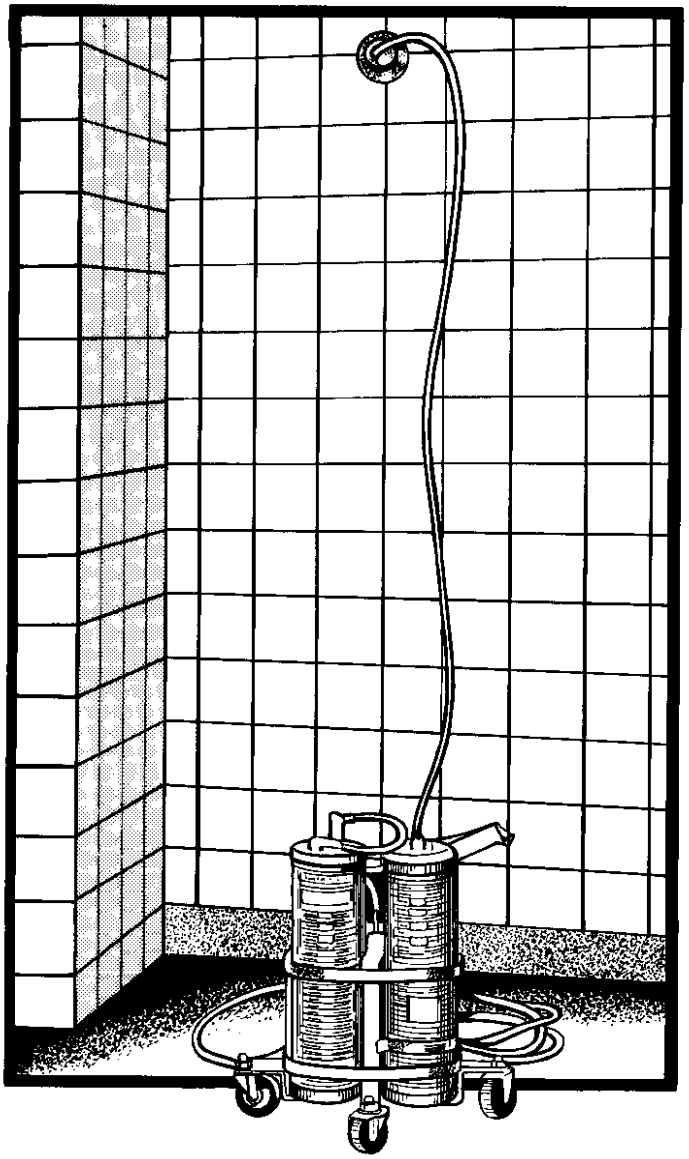


Figure 1-23. Suction apparatus.

1-20. SPONGE COUNT BOARD

A small board (see figures. 1-24 and 1-25), sometimes attached to the wall, is used to record the sponge count. The sponge count is recorded on it before surgery begins and whenever called for during the operation.

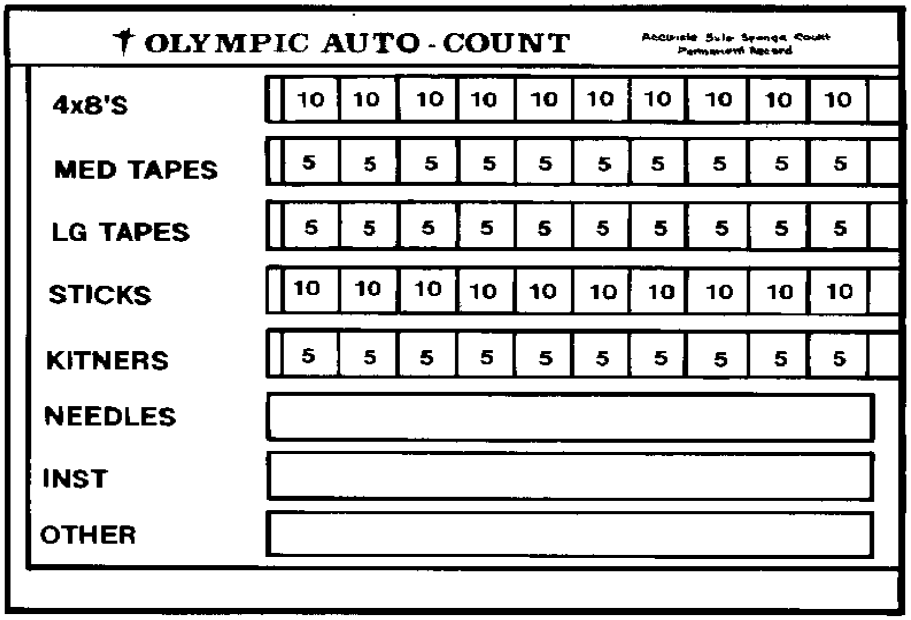


Figure 1-24. Sponge count board (before count). Numbered blocks are covered with removable tape

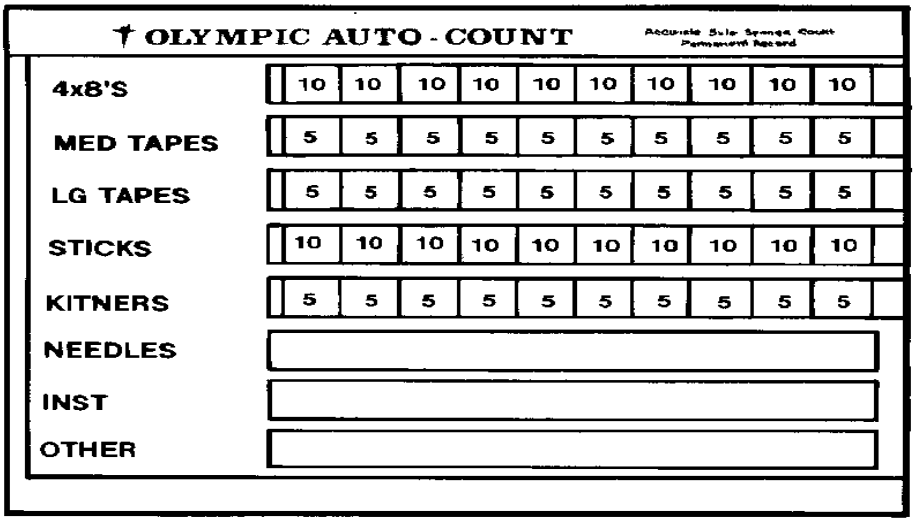


Figure 1-25. Sponge count board (after count). Numbered blocks are uncovered.

1-21. ADDITIONAL EQUIPMENT

a. **Endoscopy.**

(1) General. Endoscopy is a visual examination of the interior of the body cavity, hollow organ, or structure with an endoscope, an instrument designed for direct visual inspection. The endoscope usually is inserted into a natural body orifice, that is, the mouth, anus, or urethra. It may be inserted through a small skin incision and/or trocar puncture, as through the abdominal or vaginal wall. An endoscopic procedure is designated by the anatomic structure to be visualized.

(2) Light source. Illumination within the body cavity is essential for visual acuity. The light source may be through a fiber-optic bundle or from an incandescent light bulb.

(a) Fiber-optic lighting. This is an improved lighting system that illuminates body cavities, including those that cannot be seen with other light sources. Light is conducted through a bundle of thousands of coated glass fibers encased in a plastic sheath. Electric current must be transmitted to the light source connected to the fiber-optic bundle. With fiber-optic lighting, the electric current is entirely external to the patient.

(b) Bulbs screw into the fitting either at the end of a removable light carrier or at the end of the built-in lens system. Electric current is conducted through a single-filament wire to illuminate the tiny incandescent light bulb. A battery box with one or more sets of dry-cell batteries may be used as the power source for light bulbs. Fiber-optic lighting has replaced bulbs in most endoscopes.

(3) Accessories. Accessories such as suction tubes, snares, biopsy forceps, grasping forceps, electrosurgical tips, sponge carriers, and so forth, are used in conjunction with endoscopes. These can be passed through channels in the endoscope to remove fluid or tissue, coagulated bleeding vessels, inject fluid or gas to distend cavities, and so forth. Lensed scopes may be equipped with a still or motion picture camera so organs or lesions can be photographed during the procedure. Some rigid scopes have an obturator, a blunt-tipped rod placed through the lumen of the scope, to permit smooth insertion of the instrument as into the anus. The accessories that will be needed will be determined by the type of endoscope and the purpose of the procedure.

b. **Electrosurgical Apparatus.** The electrosurgical apparatus (unit) is an electrical machine that has a very high frequency of alternating current. Figure 1-26 shows an electrosurgical apparatus. The surgeon may use the electrosurgical apparatus to do the following procedures: cut body tissue, stop bleeding from small blood vessels (coagulation), destroy abnormal growths such as a wart (fulguration), and sear or dry tissue (desiccation).

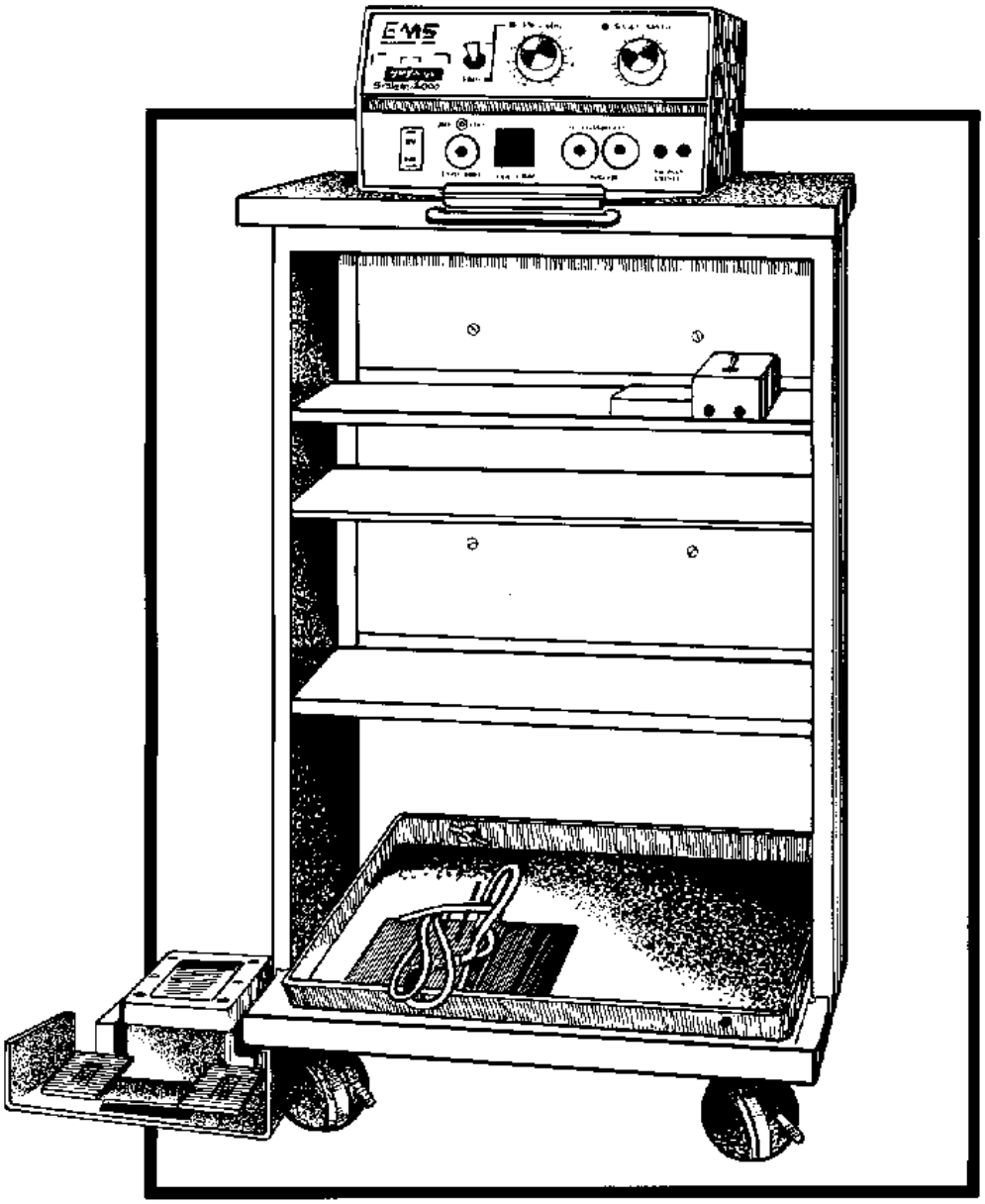


Figure 1-26 Electro surgical apparatus.

(1) Advantages of the use of electro surgery over mechanical (hand) surgery are numerous. A discussion of these follows.

(a) The electrosurgery active electrode (operative tip) can perform two processes simultaneously; it can seal as it cuts. The alternating current makes an incision in an exceedingly fine line. By adjustment of the controls, this unit can also cauterize, or literally cook, the tissue, thus closing (sealing) blood vessels instead of tying each one individually with a suture. These two processes, cutting and sealing,

may be done simultaneously or individually. These processes are particularly applicable for use in the presence of cancerous tissue. Removal of malignant growths by mechanical (hand) surgery is dangerous because cells may break off, travel to other parts of the body via the circulatory system, and spread the cancer. However, in electrosurgery, blood vessels are closed as they are cut, preventing the spread of cancer in this way.

(b) Another advantage relates to blood loss. Electrosurgery decreases blood loss. Cauterization is very effective in obtaining hemostasis (arresting the flow of blood). By setting the unit for cauterization, the surgeon need only touch the instrument to the hemostat (clamp which controls bleeding) he has placed on a bleeder and the bleeding is stopped. In mechanical (hand) surgery, each layer of tissue cut requires many hemostats and many ties. Considerable blood is lost while time is taken to tie each bleeder.

(2) The electrosurgerical apparatus has an active electrode and an inactive electrode.

(a) Current passes into the patient's body through an active electrode, the operative tip. A tip is small in area, concentrating the current; hence, it generates considerable heat where the surgeon applies it. The active electrode and its connecting cord are the only parts of the unit sterilized for the operation. This operative tip used by the surgeon is heated only while it is being used; either by a switch on the active electrode handle or by a foot switch, placed near the operating table.

(b) The electrical circuit is completed with the inactive electrode, a large plate made of CRM. This plate is large so that the energy is spread over a large surface area, such as the buttocks, dispersing the current and producing only negligible heat. The inactive electrode is often placed under the patient's buttocks because of the fleshy, smooth tissue available there which can provide a good contact. The area used for inactive electrode must be free from scars and excessive hair. Scar tissue is made up of uneven connective tissue, which does not provide good contact. Hair is not conductive and must be removed for a good contact. In addition, bony portions of the body should not be in contact with the inactive electrode because they provide an uneven current distribution, which may lead to burns. Before the inactive electrode is positioned, it should be covered with contact paste (electrocardiograph electrode paste). This paste facilitates passage of electricity. K-Y lubricating jelly should NOT be used because it is nonelectrolytic and will insulate the electrical contact. This will cause current to pass through the thin portions of the K-Y jelly, thus concentrating the current and causing burns to the patient. Disposable plates that conform to the body are also used.

(3) The OR specialist should read the instructions, usually on a plate on the machine or the instruction booklet appropriate to the machine.

(a) The circulator sets up the unsterile parts of the machine since he is the unsterile member of the team. He must set the controls according to the surgeon's orders. The circulator also places the foot pedal conveniently for the surgeon's use.

(b) The scrub sets up the sterile parts and checks the tip to ensure that all parts are present; he inserts the tip into the handle. The scrub hands the end of the cord with the plug to the circulator, who plugs it into the machine.

(c) The unit is tested for proper functioning before the operative procedure begins.

c. **Cardiac Arrest Tray.**

(1) A sterile cardiac arrest tray is kept in a place easily accessible to the ORs so that it is quickly available should a patient's heart stop beating during the induction of anesthesia or the course of surgery.

(**NOTE**: The incidence of cardiac arrest is about 1 in 800 general anesthesia.)

The tray contains the instruments necessary for opening the patient's chest and retracting his ribs, thus enabling the surgeon to use his hand to pump the patient's heart. Cardiac arrest is a dire surgical emergency because when the heart stops there is no circulation of blood and therefore no oxygen is available to the tissues. The tissues of the brain are very quickly damaged by anoxia: thus, the time limit for institution of corrective treatment is considered to be from three to five minutes.

(2) In view of the above considerations, Army hospitals require that a preparedness program be in effect. Cardiac arrest trays are therefore located in all areas where anesthesia (either local or general) is administered. All personnel working in such areas must know where the trays are located.

Section IV. ASEPTIC TECHNIQUE/INFECTION CONTROL

1-22. INTRODUCTION

a. **Discussion.** The term asepsis means the absence of any infectious agents. All things that come into contact with a wound should be free from all microorganisms (sterile) or as free as possible for the protection of the patient. In order for the OR specialist to understand the reason for doing many procedures in a way, he needs to know the principles of aseptic technique. These principles serve as a guiding factor in the performance of all tasks in a surgical suite, including the routine cleaning or housekeeping procedures.

b. **Importance.** Aseptic (sterile) technique is essential in an OR. Sterile technique is of such great importance that it may be abandoned only during an event such as cardiac arrest in a patient, in which case immediate resuscitative procedures take precedence since the time element is vital to successful treatment (refer to para 1-21c(1)). Even when cardiac arrest occurs, the decision to sacrifice sterile technique is the surgeon's. The enlisted OR specialist should never abandon sterile technique except upon order by the surgeon. Such strictness in the maintenance of sterile technique is necessary because freshly cut, living tissue can become infected easily. Therefore, it is essential that the OR specialist and all other members of the OR team know the common sources of microorganisms in an OR and the means by which these organisms reach the sterile field to contaminate it. Team members must know how to prevent contamination of a sterile field.

c. **Responsibility for Maintenance**. The maintenance of sterile technique is the responsibility of everyone having duties or even being in the OR during an operative procedure.

(**NOTE**: Sterile technique cannot be maintained unless practiced by all team members.)

Asepsis may be thought of as a chain, which is as strong as its weakest link.

d. **Surgical Conscience**. (Knowledge and Application of Principles of Aseptic Technique). A "surgical conscience" is the foundation upon which the skill and techniques employed by the OR specialist are built. He must know and apply the principles of sterile technique. Breaks in technique may allow the entrance of infectious organisms that the tissues cannot destroy. Even a so-called "mild" infection will delay a patient's recovery, and a "mild" infection may quickly become a severe one. Thus, any infection is potentially a threat to the life of a patient. The OR specialist should be acutely aware that antibiotics are no substitute for sterile technique and should follow the principles of such technique painstakingly. The specialist--and all other teams members--should never be reluctant to admit a possible break in technique, even if there is doubt about it. Any part of the sterile field, including the sterile gowns and gloves of team members, should be replaced with fresh, sterile items if any doubt arises as to their sterility.

e. **Sources of Contamination.** In order to control infection, there must be control over the sources of contamination. Bacteria are present in the air, water, food, man-made objects, skin, mucous membranes, nose, throat, and soil. In the OR,

there are specific sources of possible contamination, which are a constant threat to an open incision. These should be recognized and controlled. These sources of contamination are:

(1) Members of the OR team (their clothing, breath, skin, hair, and so forth).

(2) The patient.

(3) All items used in the wound and on the sterile setup.

(4) Dust in the air.

(5) Other personnel, including visitors, in the OR.

1-23. PRINCIPLES

The principles of sterile technique are applied in various ways. The principles and their application of sterile technique will be discussed in the following paragraphs.

a. All materials used as a part of the sterile field for an operation must be sterile. Certain basic items such as the linen, the instrument set, and the basins may be obtained from the supply kept in the sterile supply room. Others, such as specialized surgical instruments, may be sterilized the night before or immediately preceding the operation and taken directly from the sterilizer to the sterile operative field.

(1) Linen used in the OR is usually dyed green. This helps to reduce the glare from lights, thus reducing fatigue and eyestrain. Also, green linen helps to eliminate potential contamination from the wards, since linen in the wards is colored differently and should not be used in the OR.

(2) Moreover, linen selected for use in the OR should be checked to ensure that it is not torn, frayed, or stained, and that no holes are present in the cloth. Likewise, linen should be handled gently to prevent lint and dust from being spread about the room.

(3) Only materials known to be sterile should be used and their sterility should be maintained throughout the operative procedure.

b. Only persons who are "sterile" should touch sterile articles. "Unsterile" persons should only touch unsterile items. All supplies for the "sterile" team members (scrub, surgeon, and assistants) are provided by the circulator. The "unsterile" team member protects the sterility of items through the use of the wrappers on sterile packages (see figure 1-27).

Figure 1-27. Scrub reaching for sterile supplies.

NOTE: Observe the way in which the circulator handles the sterile wrapper.

c. Items should be considered unsterile if there is doubt about their sterility.

(1) If a sterile-appearing package is found in an area not designated for sterile storage, it is considered unsterile and must be reprocessed and resterilized or discarded.

(2) If there is doubt about the timing of a sterilizer, its contents are considered unsterile.

(3) If an "unsterile" person brushes against a sterile table, the table is considered contaminated. If a "sterile" person brushes against an unsterile table, the person's sterile gown is considered contaminated.

(4) If a sterile table or sterile items are left uncovered and unguarded, the table and items are considered unsterile.

d. "Unsterile" persons should avoid reaching over a sterile field. "Sterile" persons should avoid reaching over an unsterile area.

(1) The scrub sets basins or glasses to be filled at the edge of the sterile table opposite where he stands. The circulator stands near the edge of the table to fill them.

(2) The circulator stands at a distance from the sterile field when adjusting the light over it.

(3) A "sterile" team member turns away from the sterile field to have perspiration mopped from his brow.

(4) The scrub drapes the part of an unsterile table nearest him first.

e. Only the top surface of a draped table is considered sterile.

(1) Linen or sutures falling over the edge of the table should be discarded. The scrub should not touch the part hanging below the table level.

(2) When the circulator uncovers a sterile table, he should be careful that the edge of the sheet nearest the floor is not brought up to table level where it might contaminate the sterile contents.

(3) When the scrub drapes a table with sterile linen, he should see that the part of the linen, which drops below the table's surface is not brought up to table level again.

f. The parts of a surgical gown (see figures. 1-28 and 1-29) considered sterile are the sleeves (except for the axillary area) and the front from waist level to a few inches below the neck opening.

Figure 1-28. Sterile team member's attire (front view).

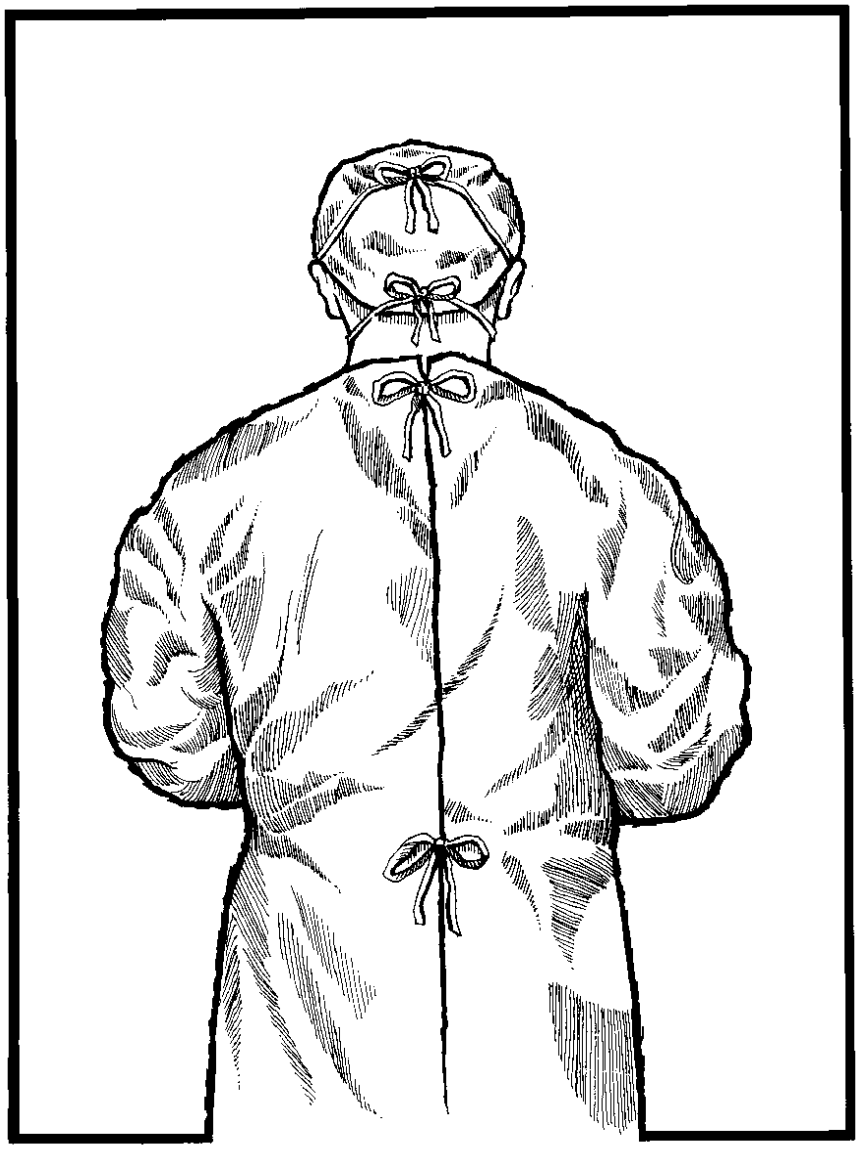


Figure 1-29. Sterile team member's attire (back view).

(1) A "sterile" person should keep his hands in sight and at waist level or above (see figures. 1-28 and 1-29).

(2) A "sterile" person should keep his hands away from his face and his elbows close to his sides (see figure 1-28). He should never fold his arms, since his gown may be moist with perspiration in the axillary region; thus, his gloves would be contaminated. When a "sterile" person stands on a footstool, the lower part of his gown should not brush the sterile table.

(**NOTE**: Common sense determines sterile parts of a gown worn by tall and short members in relation to their waists and the tops of sterile tables.

g. The edge of a cover that encloses sterile contents is not considered sterile. Such covers include the edges of wrappers on sterile packages, the caps on solution flasks, and test-tube covers. No definite line separates the sterile from the unsterile area at the edge of the cover; therefore, the edge is considered unsterile.

(1) The scrub should lift contents from packages by reaching for them with the arm straight out and lifting the items straight up--with the elbow held high throughout the procedure (see figure. 1-27).

(2) The circulator lifts the cap from a solution flask or test tube so that the edge of the cap never touches the lip.

(**NOTE**: Caps are not replaced)

The entire contents are dispensed and any excess solution is discarded.

(3) When a circulator opens a package, his hands are placed under the cuff to provide a protected wide margin of safety between the inside of the sterile pack and the unsterile hands. When a sterile article that is wrapped sequentially in two wrappers with the corners folded toward the center of the article is opened, the circulator opens the corner farthest from his body first and the corner nearest his body last.

h. "Sterile" team members keep well within the sterile area. The scrub should allow a wide margin of safety when passing unsterile areas. The scrub as well as all other "sterile" team members should observe the following practices:

(1) "Sterile" team members should stand back at a safe distance from the operating table while draping the patient.

(2) "Sterile" team members should pass each other back-to-back.

(3) A "sterile" team member should turn his back to an "unsterile" person or area when passing.

(4) A "sterile" team member should face a sterile area when passing.

(5) "Sterile" team members should stay near the sterile tables when waiting for a case to begin. They should not wander about the room nor go out into the corridor.

i. "Unsterile" team members should keep away from sterile areas. "Unsterile" persons should allow a wide margin of safety when passing sterile areas and should follow the rule for passing--"unsterile" persons should face a sterile area when passing it to be sure they have not touched the area. In addition, "unsterile" persons should not go within the sterile "circle" or between two sterile fields. An unsterile team member should never crowd past a "sterile" team member.

j. "Sterile" team members should keep their contact with sterile areas to a minimum.

(1) "Sterile" team members should not lean on the sterile tables nor on the draped patient.

(2) The scrub should keep the large instrument table (back table) and the Mayo stand far enough away so that the gowns of "sterile" team members do not brush the area.

k. Sterile areas should be protected from moisture because a moist item may become contaminated. When moisture soaks through a sterile area to an unsterile one, or vice versa, a means of transporting infectious organisms to the sterile area is provided. Therefore, the OR specialist should observe the following rules of practice:

(1) Sterile packages should be laid on dry sterile areas.

(2) If any portion of a sterile package becomes damp or wet, the entire package should be either resterilized or discarded.

(3) If a sterile package falls on the floor, it is considered unsterile.

(4) Ampules wet with a bactericidal solution should be handled in such a way as to avoid wetting the sterile drape.

(5) A towel should be placed in the bottom of an instrument tray before placing the instruments in it for autoclaving. The towel will absorb the moisture and permit the tray to be set upon a sterile table after being autoclaved.

(6) Linen packages from the sterilizer should be permitted to cool before being stored on shelves. This procedure prevents packages from becoming damp from steam condensation when placed upon a cool shelf.

(7) Sterile drapes should be placed on a dry surface. Thus, time should be allowed for the prep solution used to paint the patient's skin to dry before draping is begun.

(8) During surgery, if a solution soaks through a sterile area from an unsterile one--or through an unsterile area from a sterile one, the wet area should be covered with another sterile drape.

l. Whenever microorganisms cannot be eliminated from a field, they should be kept to an irreducible minimum. Although absolute asepsis in an operative field cannot be reached, every effort is made to control sources of possible contamination (refer to (1)-(4) below).

(1) Skin. Skin cannot be sterilized. Skin normally harbors staphylococcus and other organisms; however, any agent capable of sterilizing skin will also destroy the skin. The skin of the patient as well as that of members of the "sterile" team is therefore a potential source of contamination in every operation. However, this does not remove the need for strict aseptic technique. Defenses within the patient's body will usually overcome the relatively few organisms left on the skin when the following protective measures are carried out:

(a) The patient's skin is given a shave and scrub before surgery, and is again thoroughly cleansed in the OR just prior to the incision.

(b) The skin of OR personnel is another source of contamination. They follow rigid steps in scrubbing their hands and arms, using brushes and detergents and adhering to strict technique. This is done to remove the maximum number of organisms. When drying their hands, hand towels should not touch their scrub clothes.

(c) "Sterile" team members gown and glove without touching the outside of gowns or gloves with their bare hands.

(d) All of the patient's skin area except the site of incision is covered with sterile drapes.

(e) When no longer needed, the knife used for the skin incision is placed in a basin and kept within the sterile area by the scrub.

(f) Sterile towels/materials may be used to cover the skin after the incision is made. The reason for this additional precaution is to protect the surgical wound from the waste products continually excreted by the skin, because this waste contains microorganisms. In addition, airborne organisms continuously pose a threat of contaminating the incision.

(g) If a "sterile" team member's glove is punctured during an operation, the glove is to be changed at once. If the glove is pricked by a needle or an instrument, the glove is to be changed immediately and the needle or instrument is discarded from the sterile field. Notify the circulator of the needle's whereabouts.

(h) The cap, worn on the head of team members, should completely cover the hair to prevent particles of dandruff or hair from falling on the sterile field or in the room. Refer to figures 1-28 and 1-29.

(2) Mucous membrane. Some areas cannot be scrubbed. Mucous membrane is not scrubbed since scrubbing would damage the tissue. When the site of operation is the mucous membrane of the nose, mouth, throat, or anus, the number of microorganisms present is great. However, the various parts of the body do not usually become infected by organisms that normally inhabit those parts. Even so, an effort is made to reduce the number of organisms present in an operative area and to prevent scattering the remaining ones.

(a) As much of the operative area is cleansed, as is feasible and the surrounding skin is scrubbed.

(b) When the specialist is scrubbing the patient's skin, the surgeon makes an effort to use a sponge only once for mopping an area. Once he removes the sponge from contact with the skin, he discards the sponge into a kick bucket.

(3) Infected areas. Infected areas are grossly contaminated. The "sterile" team members should avoid scattering the contamination. In addition, cases involving infected areas require a special cleanup procedure following the operation.

(4) Air. The air is contaminated by dust and droplets.

(a) Team members are required to wear a mask covering the nose and mouth (refer to figure 1-28). A mask is worn not only during an operative procedure, but also any time personnel enter the OR. The mask must cover the mouth and nose entirely and be tied securely to prevent venting. The strings should not be crossed when tied because the sides of the masks will gap. A pliable metal strip is inserted in the top hem of most masks to provide a firm contour fit over the bridge of the nose. This strip also helps prevent fogging of eyeglasses. Air should pass only through the filtering system of the mask. Masks should be either on or either off. They should not be saved from one operation to the next by allowing them to hang around the neck or by tucking them into a pocket. Bacteria that have been filtered by the mask will become dry and airborne if the mask is worn necklace fashion. By touching only the strings when removing the mask, contamination of the hands will be reduced. Masks should be changed between procedures and sometimes during a procedure, depending on the length of the operation and the amount of talking done by the surgical team.

(b) When possible, the respiratory tract of the patient should be isolated from the incision. In some cases, isolation is achieved by using the ether screen. This serves as a barrier between the incision and the respiratory tract.

(c) Team members should not talk except when essential. Silence assists masking to reduce the number of organisms spread from nose and throat.

(d) Team members should avoid sneezing and coughing if possible.

(e) Persons who have colds or any active infection should be excluded from the OR.

(f) The scrub should cover the sterile tables with sterile drapes if an operation is delayed.

(g) Main corridors are considered contaminated areas; therefore, doors from corridors into the ORs should be kept closed. Sterile items without wrappers should not be carried through corridors. (Note the scrub room and the sterilizing area open directly into an OR in figure 1-3.) If "sterile" team members must go out into the corridor, they should change their gowns and gloves upon returning to the room.

(h) Walking through and around the OR should be kept to the necessary minimum.

(i) Visitors should sit in an observation balcony. If the entrance to this balcony is inside the surgical suite, visitors will be required to change into scrub clothes.

(j) All dusting should be damp dusting with a germicide solution. Floors should be wet-vacuumed between cases as well as at the end of the day. Dry dusting and dry mopping should be avoided in the OR, as the dust created by use of such methods would continue to settle or float in the room for hours.

(k) Powder is no longer used in the glowing process because it is likely to drift in the air, and it may cause adhesions in the surgical wound as it heals. Disposable gloves are slightly powdered, and even this is always rinsed off with sterile normal saline solution.

(l) Scrub clothes will not be worn outside the surgical suite.

(m) The bedclothes over the patient should be handled gently when he is being transferred to the operating table to avoid throwing lint off into the air. Local policy may require bedclothes to be removed in an interchange area prior to the entry in the OR; nevertheless, the patient should be covered with a cover sheet.

(n) Dressings removed from a wound should be placed at once in a bag, and the bag should be closed and discarded. Drainage that is left exposed to the air may become dried, thus enabling the infectious organisms in it to become airborne and carried to other parts of the surgical suite and the hospital to infect others.

(o) The circulator (and other team members performing nonsterile duties) should wash their hands before and after the care of each patient.

Section V. ORIENTATION TO AN INDIVIDUAL OPERATING ROOM

1-24. INTRODUCTION

In addition to knowledge of the equipment used in an OR, the OR specialist must also be familiar with the arrangement of furniture and equipment for various kinds of operations, since one of his duties will be the preparation of the room for an operative procedure. Several factors are taken into consideration in determining the arrangement of the furniture for a particular operation. Although the OR specialist may not be required to make the decision as to the overall arrangement of the furniture, he must keep in mind the relationship between "sterile" and "unsterile" team members (refer to paragraphs 1-23i and 1-23j). The furniture should be grouped to facilitate the maintenance of aseptic technique. Furniture that will be draped for use by the "sterile" team members should be grouped together and adequate space should be allowed between this furniture and the equipment to be used by "unsterile" team members to promote sterile conditions.

1-25. PHYSICAL ARRANGEMENT OF ITEMS

a. **Discussion.** The furniture and equipment already discussed is common to all cases and is kept within each OR. However, the type of operative procedure and the method of administering anesthesia are the primary factors in determining the supplies and equipment that are required as well as their arrangement. Some of the equipment (normally kept in each OR but not scheduled for use on a particular case) may be pushed to the wall in one area where it will not interfere with the team member's work during the case. Equipment used infrequently may be brought to an OR for a particular case and then returned to its storage area when the case is finished.

b. **Grouping of Equipment.** The arrangement of the operating table and the supply tables is determined not only by the type of case, but also by the location of the operative area and the number supplies necessary. The furniture may be grouped with the patient's head toward the door or toward any other part of the room. Figures 1-30 A, B, C, and D show suggested grouping of items for general surgery, perineal surgery, orthopedic surgery, and neurosurgery. In the figures, note the placement of sterile instrument tables with relation to the area for the anesthetist (anesthetist's stool). All sterile equipment and the "sterile" team members are as far away from the "unsterile" anesthesiologist and his equipment as feasible to help promote the maintenance of aseptic technique.

1-26. NEED FOR QUIET

During an operative procedure, all conversation in the OR should be kept to a minimum to aid concentration, lessen distractions, allow personnel to work both as quickly and efficiently as possible, and help promote aseptic technique.

1-27. LEANUP FOLLOWING SURGERY

Just as important as the many aspects of the surgery itself is the cleanup afterwards and the manner in which it is done. The element of time is pressing between cases; therefore, the scrub and the circulator must work together as quickly as possible to remove all used equipment and supplies, clean the room, and prepare it for the next case. The usual time allotted is the same as for the original preparation of the room--20 to 30 minutes. Cleanliness is of utmost importance since aseptic technique cannot be attained or maintained in an environment that is not scrupulously clean.

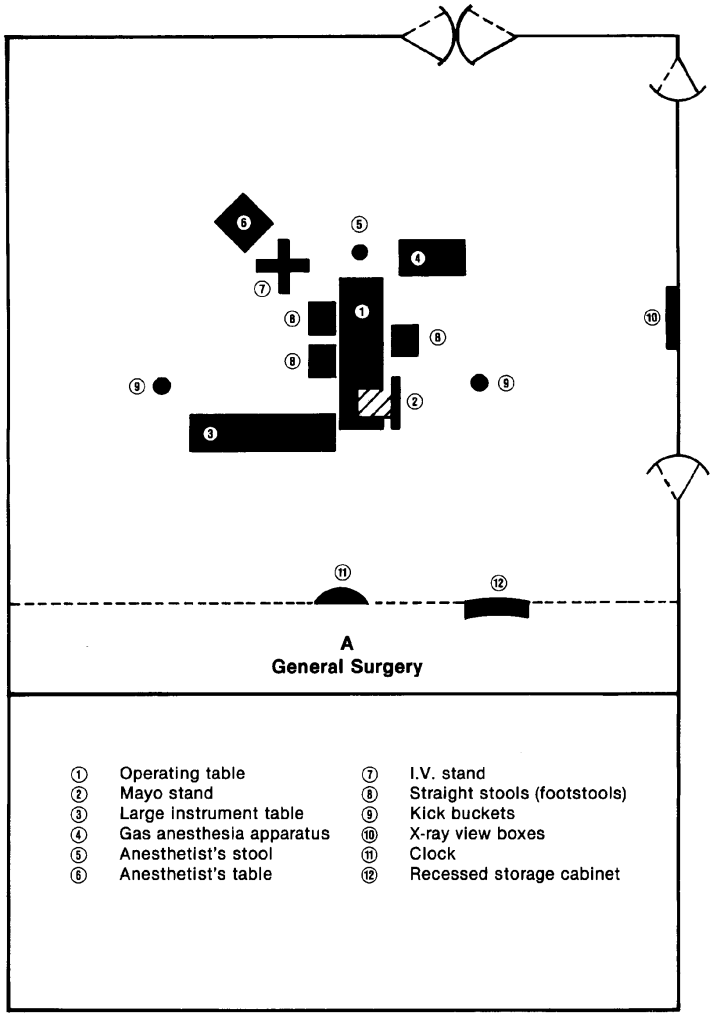


Figure 1-30 A. Grouping of equipment for General Surgery.

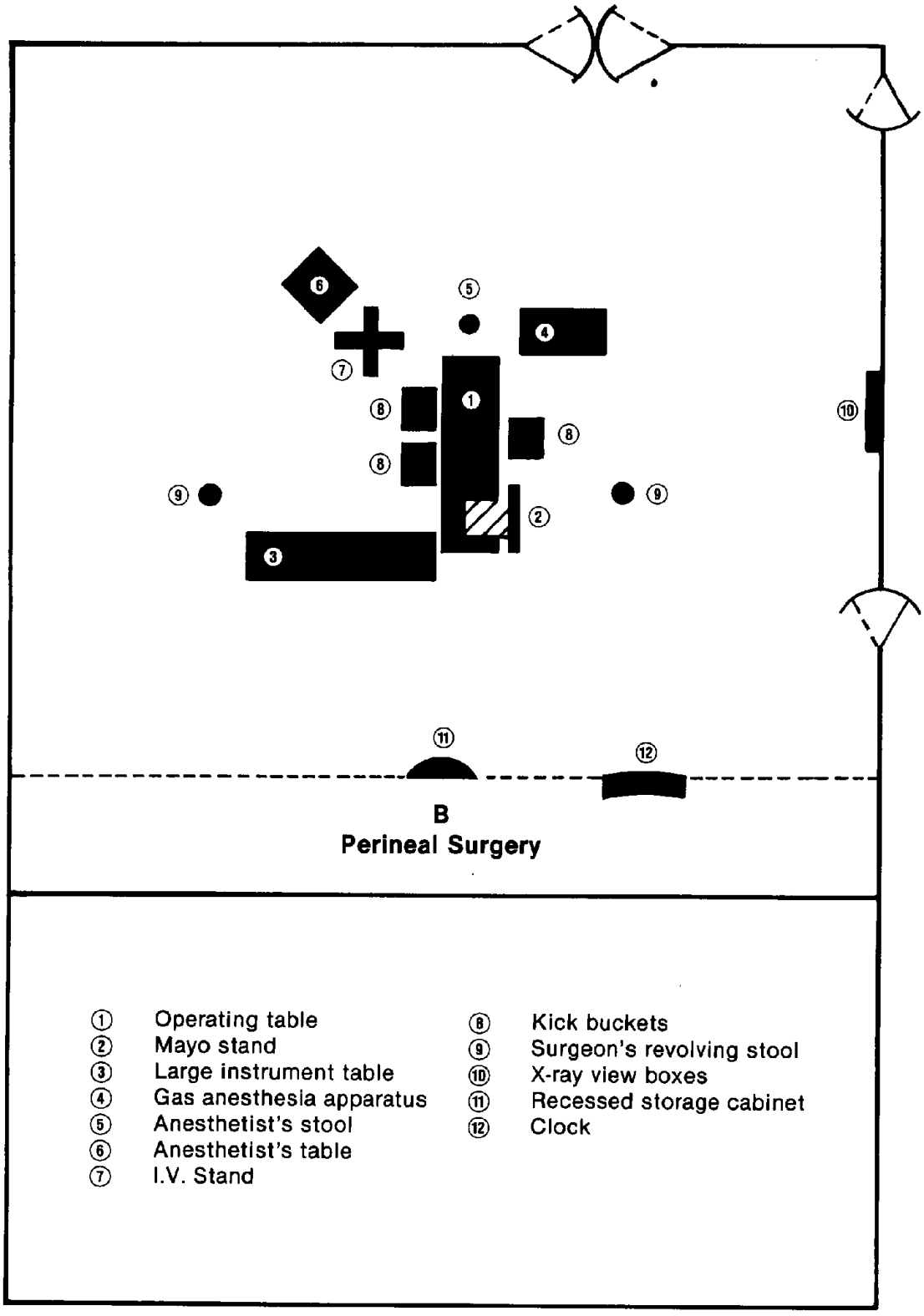


Figure 1-30 B. Grouping of equipment for Perineal Surgery.

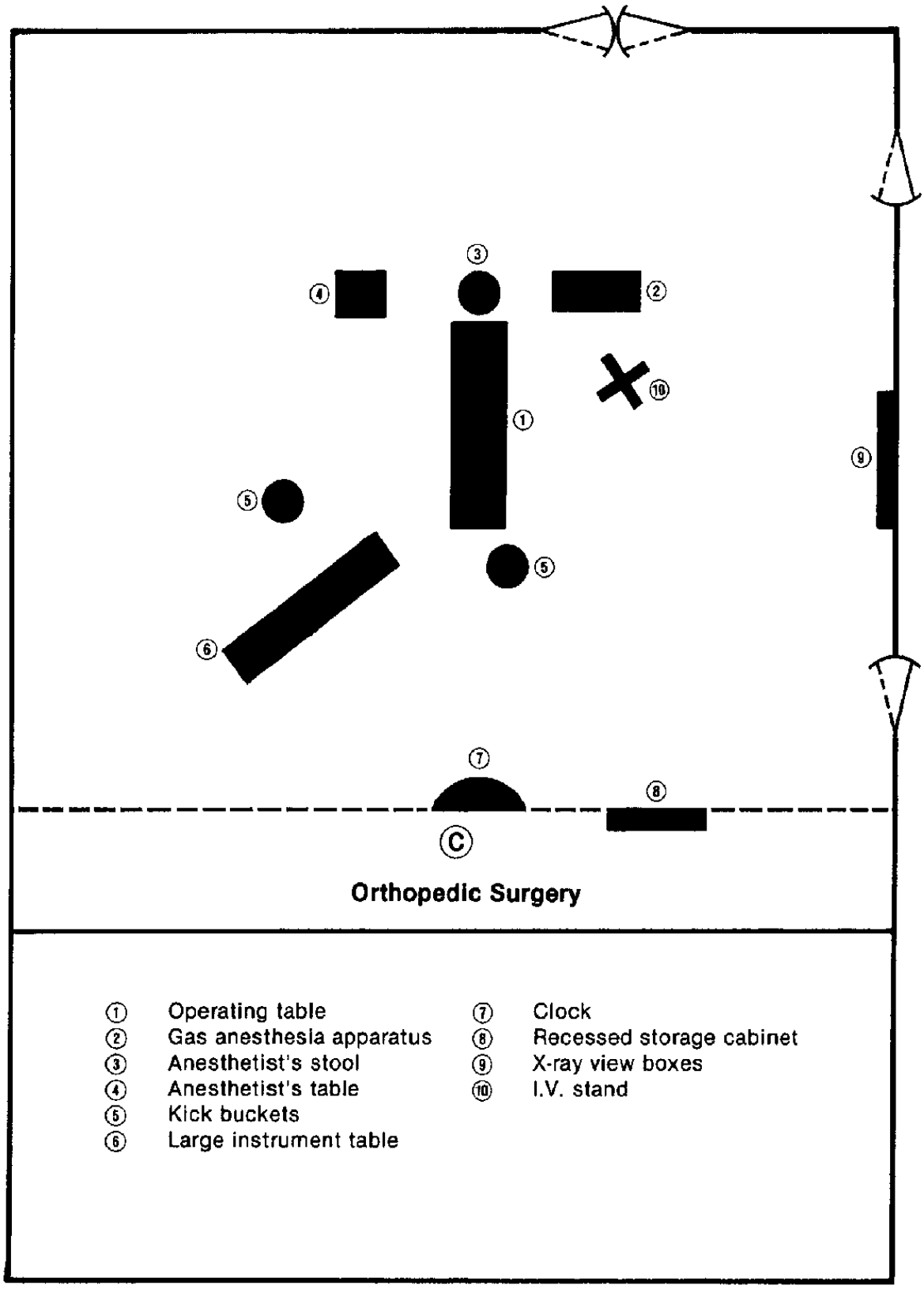


Figure 1-30C. Grouping of equipment for Orthopedic Surgery.

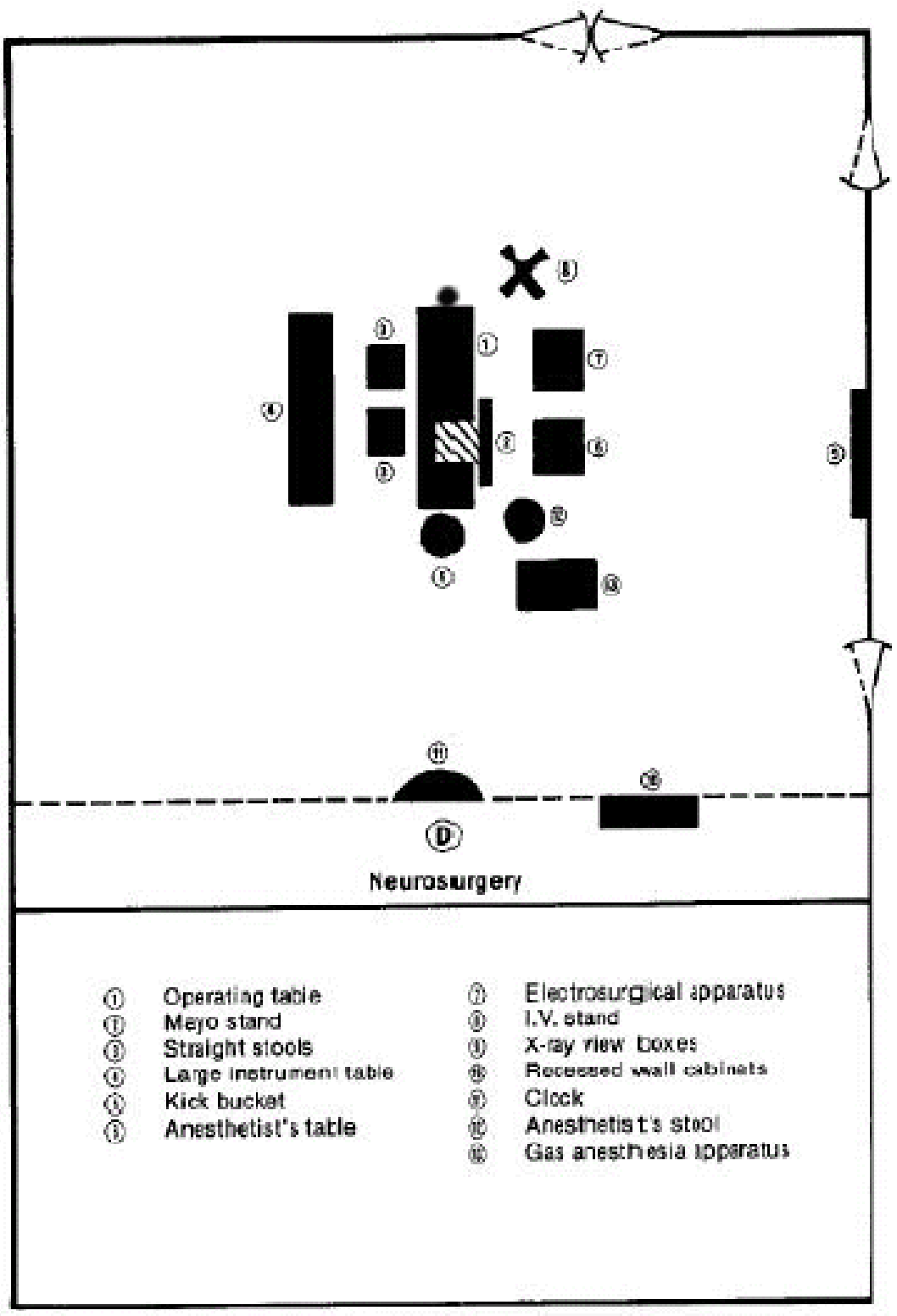


Figure1-30D. Grouping of equipment for Neurosurgery.

Section VI. HOUSEKEEPING

1-28. INTRODUCTION

The maintenance of cleanliness at all times in the OR suite is of extreme importance because infectious organisms are present both on floors and in the air. Such organisms exist in large numbers wherever dirt and dust are present. In addition, soil of any kind (dirt, blood, pus, and so forth) serves to protect infectious organisms; therefore, the suite must be kept spotlessly clean. For the same reason, the suite must be kept as free from dust as possible. Thus, housekeeping procedures are vital to the maintenance of aseptic technique and the prevention of wound infection. The OR specialist will be assigned various cleaning tasks and should therefore have knowledge of the methods employed as well as their limitations in order that cleaning will be most effective.

1-29. RULES

a. **Discussion.** Cleaning routines and procedures may vary somewhat among hospitals, but they are based upon a number of rules, which should always be observed. These rules are as follows:

(1) The formation and the dispersion of dust should be suppressed.

(2) Time should be allowed for dust to settle.

(3) Dust and soiled laundry should not be allowed to accumulate.

(4) A systematic housekeeping plan should be followed.

(5) Periodic cultures of the floors should be taken before and after cleaning, as should cultures of the air in an oOR during periods of minimum and maximum activity.

b. **Local Policy.** Within the surgical suite of a hospital, the time and the frequency for cleaning the various areas in the suite will be done as a matter of routine. This routine, as well as the specific procedure to be used, is included in the OR policy. Although various cleaning procedures are set forth in the following paragraphs for the information of the specialist, he should follow local policy when performing cleaning assignments.

1-30. FLOOR CLEANING

Cleaning of the floors in the OR may be accomplished by any of several methods or by a combination of methods, the wet-dry-vacuum method (refer to paragraph 1-31), the mop-and-pail method (refer to paragraph 1-32), and the scrub-or-spray-machine method (refer to paragraph 1-33). The wet-vacuum method is used more frequently than the other methods.

1-31. WET-VACUUM METHOD (RECOMMENDED)

a. **Discussion.** For floor cleaning at the end of a day's schedule, the wet-vacuum method is more effective in reducing the bacterial count on the floor than the mop-and-pail method.

b. **Procedure.**

(1) Wipe down the furniture with a germicide solution and remove it from the room.

(2) Flood the floor with a germicide, beginning with the most heavily contaminated area (usually the area around the operating table). If flooding does not remove the soil, scrub the area with a clean mop head and pour additional solution on the area. At this point, the solution will have been on the floor for several minutes.

(3) Remove the excess solution from the floor with the wet vacuum pickup. This ensures that dirty solutions are removed from cracks, crevices, corners, and so forth.

(4) Wheel the furniture into the OR over a germicide-soaked mat.

(5) Wipe the furniture down with a germicidal solution.

1-32. MOP-AND-PAIL METHOD (ALTERNATIVE)

a. **Rules.** The mop-and-pail method of floor cleaning can spread infectious organisms throughout the OR suite unless certain rules are understood and followed.

(1) There should be an individual mop for each area within the surgical suite.

(2) Operating room mop heads should be laundered and sterilized daily.

(3) A fresh germicidal solution should be used for each area.

(4) Mop heads should not be stored in used germicidal solution between periods of utilization.

(5) Mop heads should be changed between all cases.

b. **Procedure.**

(1) For cleaning an OR between cases, the soiled areas of the floor are damp-mopped using a germicidal solution. Furniture may be pushed aside as necessary, but is not to be removed from the room.

(2) Before surgery begins in the morning, the floor is damp-mopped with a germicidal solution.

(3) For cleaning the floor at the end of the day's schedule, observe the rules listed in paragraph 1-32a then apply the following procedures:

(a) Wipe down the furniture with a germicidal solution.

(b) Remove the furniture from the room.

(c) Mop the floor using fresh germicidal solution and a clean mop head.

(d) Rinse the floor well to prevent the accumulation of soap film and the film left by certain germicides because such a film would interfere with the conductivity of the floor.

(e) Wheel the furniture back into the room over a mat saturated with a germicidal solution.

(f) Wipe down the furniture again with a germicidal solution.

1-33. SCRUB-OR-SPRAY-MACHINE METHOD

The is the same procedure as described for the wet-dry vacuum method, except that the machine has a capability of either scrubbing the floor or of spraying the germicide onto the floor. The wet-vacuum pickup is done as described in paragraph 1-31b (4).

1-34. ROUTINE CLEANING OF AN OPERATING ROOM

a. **Before Surgery is Begun.** Before surgery begins in the morning, all furniture and the OR light are dusted with a germicide-dampened cloth and the floor wet-vacuumed or is wet-vacuumed or damp-mopped with germicidal solution. Dry dusting is never done in the surgical suite because of the hazard of increased airborne bacteria. Damp dusting is done to remove any dust that may have accumulated

overnight. This dusting should be done by the circulator 30 to 60 minutes prior to the operative procedure to allow the time for the dust particles to settle before sterile packs and supplies are opened.

(1) The dusting is accomplished by starting with the highest equipment and working down. The OR overhead light is dusted first, then the table, working from the center of the room outward and from top to bottom.

(2) As the circulator dusts and sets up the equipment, he conserves steps and energy by checking each piece of equipment at this time.

(a) The overhead light is turned on to check the bulb.

(b) The OR table is checked for proper operation.

(c) The suction machine, electro surgery machine, and other pieces of equipment in the OR are checked, whether or not they are to be used.

(3) As the supply cupboards are dusted, they are checked to be sure they are completely stocked. If there is an evening or night shift working in the OR, one of these persons may be assigned to do the dusting rather than the day personnel.

(4) When the dusting of the furniture and equipment is finished, the floor is wet-vacuumed using the germicide prescribed by local policy.

b. **Between Cases.** Following each operation, the soiled areas of the floor are wet-vacuumed or damp-mopped and any furniture, which may have become soiled or damp is cleaned. The kick bucket liner, containing soiled sponges and waste material, is removed and placed in a waste receptacle for incineration. If the suction machine was used, the container and tubing are discarded. Also, the apparatus is checked to make certain that it is functional.

c. **At the End of the Day's Schedule.** The floors are cleaned as described in paragraphs 1-31 and 1-32. As the furniture is wheeled back into the room, the furniture is cleaned with a damp cloth containing a germicidal solution being sure to remove any stains. Casters on the furniture must be cleaned and any accumulation of suture materials or dust removed. If the casters require lubrication, only dry graphite or graphite oil is used. All equipment, such as operating lights, portable lights, and suction machine, is cleaned. All electrical and mechanical equipment is checked, and any defected or nonoperational equipment is reported at once for repair. Cabinet, doors, and windows are damp dusted using a germicidal solution.

1-35. CLEANING OF OTHER AREAS IN THE SUITE

Scrub rooms (including sinks, plumbing fixtures, and walls) must be cleaned thoroughly with germicidal solution each day because bacteria multiply rapidly near plumbing fixtures. At least once a week, all cabinets, cupboards, and storage areas are washed. Sterile supplies are checked and arranged in proper order. Walls, windows and frames, and doors are washed. Metal ware is cleaned. Radiators and ventilators, if present, are vacuumed and cleaned. Air conditioning filters are cleaned as prescribed by local policy. All equipment is kept in its proper place. All painted articles, walls, and ceiling should be repainted once a year and more often if necessary. Rigid adherence to daily and weekly cleaning will ensure a clean, safe OR and increase effective and efficient care of the patient.

Continue with Exercises

EXERCISES, LESSON 1

INSTRUCTIONS: Answer the following exercises by marking the lettered response that best answers the exercise, by completing the incomplete statement, or by writing the answer in the space provided at the end of the exercise.

After you have completed all the exercises, turn to "Solutions to Exercises" at the end of the lesson and check your answers. For each exercise answered incorrectly, reread the material referenced with the solution.

1. When the electrical fixtures are installed in a surgical suite, the AC and DC outlets are marked for identification in what way?

    a. Painting signs beside them.

    b. Installing colored lights adjacent to them.

    c. Installing pilot lights into the switches.

    d. Making AC outlets of one color and shape and DC outlets of another.

    e. Constructing them with interlocking switches.

2. Outlets and switches that are not explosion-proof and are located in areas where flammable agents are to be used should be mounted five feet from what point?

    a. Above the floor.

    b. Below the ceiling.

    c. The head end of the OR table.

    d. The top of the gas anesthesia apparatus.

3. Why is the humidity in the operating room maintained between 55 and 60 percent?

   a. To provide maximum comfort to personnel.

   b. To provide maximum comfort to the patient.

   c. To reduce the explosion hazard.

   d. To promote sterile conditions.

4. The floor should be grounded in each individual operating room. The electrical circuits supplying current for lighting and wall outlets should be:

   a. Grounded.

   b. Ungrounded.

   c. Alternating current only.

   d. Direct current only.

5. In preparing an operating table for surgery, the casters must be:

   a. Oiled.

   b. Packed.

   c. Free-moving.

   d. Locked.

6. The Mayo stand is constructed with a detachable tray in order to facilitate:

   a. Passing the tray to the surgeon.

   b. Sterilization of the tray.

   c. Setting up the tray with sterile goods.

   d. Moving the stand into position for surgery.

7. The table used for holding sterile goods, other than those for immediate use during an operation, may be appropriately referred to as the _____ table.

    a. Back.

    b. Mayo.

    c. Prep.

    d. Anesthetist's.

8. The electrode tip for the electro surgical unit is set up by the:

    a. Surgeon.

    b. Circulator.

    c. Anesthetist.

    d. Scrub.

9. Possible sources of contamination during a patient's surgery include:

    a. Only the surgeon.

    b. Only the circulator.

    c. Only dust in the air.

    d. Only instruments used in the wound.

    e. All of the above.

10. Supplies for the "sterile" team members are provided by whom?

    a. Scrub.

    b. Circulator.

    c. Surgeon.

    d. Anesthetist.

11. A circulating specialist is passing a sterile area; he should face the sterile area in order to:

    a. Observe whether he has provided all needed items for the set-up.

    b. Ensure that he doesn't touch the setup.

    c. Facilitate communication with the scrub specialist.

    d. See that the scrub has done the draping properly.

12. A specialist is cleaning floors in the surgical suite using the mop-and-pail method. He should:

    a. Soak mop heads in germicidal solution between periods of utilization.

    b. Ensure that mop heads are laundered no less than once a week.

    c. Use a fresh germicidal solution.

    d. Change mop heads and germicidal solution daily.

13. If performed in the correct sequence, which operation is performed LAST?

    a. Wheel furniture over germicide-soaked mat.

    b. Wipe furniture down with a germicidal solution.

    c. Remove solution from floor with wet-vacuum pickup.

    d. Wheel furniture into the hallway.

14. What solution is generally used for dusting in the surgical suite?

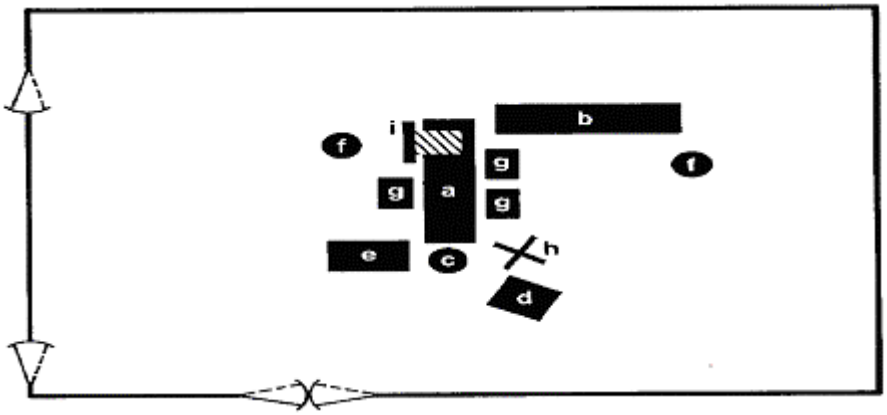
    a. Ten percent formalin solution.

    b. Normal (0.9 percent) saline.

    c. Germicide.

    d. Distilled water.

FOR EXERCISES 15 THROUGH 22. The drawing below depicts an appropriate way of grouping furniture and equipment for a general surgery operation. The item labeled **c** is the anesthetist's stool.



15. What equipment or piece of furniture is **a**?

    _____

16. What equipment or piece of furniture is **b**?

    _____

17. What equipment or piece of furniture is **d**?

    _____

18. What equipment or piece of furniture is **e**?

_____

19. What equipment or piece of furniture is **f**?

_____

20. What equipment or piece of furniture is **g**?

_____

21. What equipment or piece of furniture is **h**?

_____

22. What equipment or piece of furniture is **i**?

_____

Check Your Answers on Next Page

SOLUTIONS TO EXERCISES, LESSON 1

1. d (para 1-9b)
2. a (para 1-9b)
3. c (para 1-10)
4. a (para 1-9a; 1-7b)
5. d (para 1-12)
6. b (para 1-13a)
7. a (para 1-13b)
8. d (para 1-21b(3)(b))
9. e (para 1-22e)
10. b (para 1-23b)
11. b (para 1-23j)
12. c (para 1-32a(3),(5))
13. b (para 1-31b(5))
14. c (para 1-34a)
15. Operating table (figure 1-30A)
16. Back table (para 1-14b; figure 1-30A)
17. Anesthetist's table (figure 1-30A)
18. Gas anesthesia apparatus (figure 1-30A)
19. Kick bucket (figure 1-30A)
20. Straight stool (figure 1-30A)
21. Intravenous stand (figure 1-30A)
22. Mayo stand (figure 1-30A)

End of Lesson 1

LESSON ASSIGNMENT

LESSON 2	Operating Room Personnel, Policies, and Nomenclature
LESSON ASSIGNMENT	Paragraphs 2-1 through 2-35.
LESSON OBJECTIVES	After completing this lesson, you should be able to:

2.1 Select the correct answers to questions regarding surgical nomenclature.

2.2 Identify responsibilities and lines of authority of OR personnel.

2.3 Select the correct answers to questions, which demonstrate a knowledge of legal and ethical responsibilities of or personnel, including dealing with bereavement.

2.4 Identify the forms and other sources of information needed in the OR.

SUGGESTION After completing the assignment, complete the exercises at the end of this lesson. These exercises will help you to achieve the lesson objectives.

LESSON 2

OPERATING ROOM PERSONNEL, POLICIES, AND NOMENCLATURE

Section I. SURGICAL NOMENCLATURE

2-1. INTRODUCTION

a. **Discussion**. The OR specialist should be familiar with surgical nomenclature, the terminology used in the OR. Knowledge of nomenclature enables the specialist to understand the surgery being performed so that he may prepare for it adequately and assist the surgeon efficiently. Word combinations are used frequently to identify different parts of the body, various disease conditions, or specific operative procedures. Terms used to designate certain operative procedures may be derived from either the name of the surgeon who originally developed the technique or from the anatomical area involved. The terms defined in the following paragraphs (2-1 through 2-11) are intended to supplement the OR specialist's knowledge of medical vocabulary. The specialist can further enhance his understanding of the terminology pertaining to surgical procedures by the use of a standard medical dictionary.

b. **Objectives of Surgery.** Surgery is usually performed in order to accomplish one of three objectives--to alleviate pain, to cure by removing diseased organs, or to repair or reconstruct a part. The surgical procedures themselves may be classified as follows:

(1) Palliative. A surgical procedure that is intended to relieve pain rather than cure the disease.

(2) Curative. A surgical procedure in which the diseased organ is removed.

(3) Plastic. A surgical procedure in which the part is repaired or reconstructed.

(4) Diagnostic. A surgical procedure for the purpose of diagnosing.

2-2. TERMS PERTAINING TO OPERATIVE PROCEDURES

a. **Classification of Operations.** Surgical operations can be classified according to the type of procedure, as follows:

(1) Incision.

(2) Excision.

(3) Amputation.

(4) Introduction.

(5) Endoscopy.

(6) Repair.

(7) Destruction.

(8) Suturing.

(9) Manipulation.

b. **Discussion.** The following paragraphs give suffixes as well as complete phrases, words, and synonymous terms descriptive of operative procedures in the above classifications ((1)-(9)). In addition, examples of kinds of operations in each category are given, though these are not all inclusive. However, with this basic information, the specialist can further enhance his understanding of surgical terminology through the use of a standard medical dictionary.

2-3. INCISION PROCEDURES

a. **Discussion.** Incision is a cutting into, a formation of an opening. The suffixes commonly used for operations classified as incisions are:

(1) -(o)tomy--to cut into.

(2) -(o)stomy--to provide with an opening.

(3) -centesis--puncture or perforation.

b. **Otomy Procedures.** Otomy procedures, with examples, include the following:

(1) Exploratory operation.

Laparotomy--cutting into the peritoneal cavity for exploratory purposes.

(2) Removal of foreign bodies.

(a) Accidental.

Sclerotomy--removal of a foreign body from the eye.

(b) Therapeutic.

Arthrotomy--removal of a surgical nail, pin, screw, and so forth, from a joint.

(c) Pathological.

Nephrolithotomy--removal of kidney stones.

(3) Division of a structure.

Myotomy--cutting or dissection of a muscle; also neurotomy, tenotomy.

(4) Decompression.

Craniotomy--cutting into the skull for relief of pressure on the brain.

c. **Ostomy Procedures.** Ostomy procedures, with examples, include the following:

(1) Surgical creation of an artificial passageway.

Gastrostomy--an artificial passageway through the abdominal wall to the stomach.

(2) Formation of an artificial opening.

Colostomy--formation of an opening in the abdominal wall for exteriorization of the colon.

d. **Centesis Operations.** Centesis operations include the following kinds of procedures, with examples:

(1) Aspiration.

Thoracentesis--puncture of the chest wall for the aspiration of fluid.

(2) Trephination.

Trephine--operation of the cornea; an opening is made into the cornea by inserting a trephine.

2-4. EXCISION PROCEDURES

a. **Discussion.** Excision is the cutting out of a part. The suffixes used to denote excision are as follows:

(1) --ectomy--to cut out or excise. Excisions are divided into two types--partial or subtotal excision (b, below) and complete or total excisions (c, below).

(2) --exeresis--to strip out. (Examples are discussed in d, below.)

b. **Partial or Subtotal Excision.**

(1) Resection.

Subtotal gastrectomy--excision of a part of the stomach.

(2) Biopsy.

Biopsy of lymph node--removal of a lymph node from a living person for examination.

(3) Curettage.

Curettage of uterus--the scooping out of retained material.

c. **Complete or Total Excision.**

(1) Radical excision.

Mastectomy, radical--removal of entire breast and axillary lymph nodes.

Chondrectomy--excision of cartilage.

(2) Obliteration (to efface).

Ligation of varicose veins--the lumen of the vein is closed.

(3) Extirpation (to "root out").

Tonsillectomy.

(4) Enucleation.

Enucleation of eye--removal of an entire eyeball.

(5) Evisceration.

Evisceration of eye--removal of contents of an eyeball, leaving the sclera.

(6) Extraction (to draw out).

Extraction of lens--cataract.

d. **Other.**

(1) -exeresis. Removal by pulling out (stripping).

(2) Neuroexeresis--stripping out of a nerve.

2-5. AMPUTATION PROCEDURES

a. **Discussion.** Amputation is the cutting off of a part.

b. **Terms Used.** Suffixes are not required to denote procedures used for amputation. The terminology used is as follows:

(1) Disarticulation of leg--amputation at knee joint.

(2) Dismemberment of toe--amputation through a metatarsal.

(3) Amputation of leg--amputation through tibia or fibula.

2-6. INTRODUCTION PROCEDURES

a. **Discussion.** Introduction is the placement of a substance into the body.

b. **Terms Used.** Suffixes are not required to indicate operations involving introduction procedures. The following terms are used:

(1) Injection--the forcing of a material such as radiopaque dye, oil, alcohol, air, etc., into a part of the body is classified as an operative procedure.

(2) Transfusion--the introduction of whole blood or its derivatives (plasma, serum albumin) directly into the bloodstream.

(3) Implantation--the placement of a prosthetic device into the orbit following enucleation of an eyeball (for example--a plastic implant). Also, the fixation of a portion of tissue such as skin, nerve, tendon, or bone into a new site in the body. Such portions of tissue are called grafts and operations for the implantation of grafts are classified as plastic procedures (see para 2-8b(1)).

(4) Insertions--the introduction of materials such as radium (or other radioactive substance), packs, tampons, drains, and so forth, into the body.

c. **Procedures.**

(1) Injection.

(a) Ventriculography--x-ray of the head following the removal of cerebral fluid from the ventricles and its replacement by air (or other contrast medium).

(b) Arteriography, cerebral--x-ray of the arteries of the brain following injection of a dye (radiopaque material) into the bloodstream.

(c) Myelography--x-ray of the spinal cord following injection of a contrast medium into the spinal canal.

(d) Injection into the nerve--95 percent alcohol or other substance may be injected into a nerve to relieve pain in the part of the body supplied by the nerve.

(2) Transfusion.

(a) Blood transfusion, indirect--administration of whole blood that has been withdrawn from a donor into a container, and kept refrigerated until ready for use.

(b) Plasma transfusion--the intravenous administration of blood plasma.

(3) Implantation.

Implantation of plastic prosthesis following enucleation of the eyeball.

(4) Insertion.

(a) Insertion of radioactive substance into the uterus--done as treatment for malignant tumor.

(b) Insertion, post-partum, of intrauterine pack--done to control post-partum hemorrhage.

2-7. ENDOSCOPY PROCEDURES

a. **Discussion.** Endoscopy is the inspection of a body cavity or a hollow viscus (organ) by the means of an endoscope.

b. **Suffix.** The suffix denoting endoscopy is -scopy. Endoscopic study may be performed on many parts of the body, including those listed in Table 2-1.

Procedure	Site
Anoscopy	the anus.
Bronchoscopy	the bronchus.
Cystoscopy	the urinary bladder.
Esophagoscopy	the esophagus.
Gastroscop	the stomach.
Laryngoscopy	the larynx.
Otoscopy	the ear.
Proctoscopy	the rectum.
Rhinoscopy	the nose.
Thoracoscopy	the chest.
Tracheoscopy	the trachea.
Urethroscopy	the urethra.

Table 2-1. Endoscopy procedures.

c. **Combined Procedures.** The surgeon may elect to combine endoscopy with one or more other surgical procedures--for example, he may perform bronchoscopy with removal of a foreign body or cystoscopy with drainage. Operative procedures that may be done in combination with endoscopic procedures are as follows:

(1) Biopsy.

(2) Dilation.

(3) Drainage.

(4) Excision.

(5) Injection.

(6) Irrigation.

(7) Removal.

2-8. REPAIR PROCEDURES

a. **Discussion.** Repair is the reconstruction, reforming, fixation, or stabilization of a part. The suffixes used for plastic surgery procedures are as follows:

(1) -plasty--the shaping or surgical formation of a body part.

(2) -(o)stomy--to provide with an opening.

(3) -desis--the binding of a body part.

(4) -pexy--the fixation or suspension of a body part.

b. -**Plasty.**

(1) Graft.

(a) Skin graft--the implantation of a portion of skin onto a body part.

(b) Bone graft--the implantation of a piece of bone to replace a removed bone or bony defect.

(c) Cartilage graft--the implantation of a portion of cartilage into a body part.

(2) Lengthen or shorten--tendon (tenoplasty).

(a) Advancement--eye muscles.

(b) Recession--eye muscles.

(3) Attach or reattach

(a) --nerves (neuroplasty).

(b) --tendons (tenoplasty).

(4) Reconstruct

(a) --nose (rhinoplasty).

(b) --ear (otoplasty).

(c) --tongue (glossoplasty).

(d) --larynx (laryngoplasty).

(e) --joints (arthroplasty).

(f) --bones (osteoplasty).

(g) --inguinal hernia (hernioplasty).

c. -**Ostomy.** This suffix indicates a plastic surgery procedure when used to denote the joining together of two parts with the formation of a permanent opening between two spaces that are usually apart from each other. For example, if a portion of intestine is removed, the usual operative procedure is to anastomose the ends (to stitch the two cut ends together). Such a plastic operation is called an enterostomy. The specific parts of the gastrointestinal tract anastomosed are indicated by naming them (see example below). Anastomosis of large blood vessels may be performed also. (Other usage of the suffix -ostomy denotes surgical procedures classified as incisions (see para 2-3a(2),c).

(1) Anastomosis--formation of a communication between stomach and bowel or between any two organs or vessels.

(2) Gastroduodenostomy--anastomosis of the stomach to the duodenum.

(3) Ileocolostomy--anastomosis of the ileum (distal portion of small intestine) to the colon.

d. **Desis.**

(1) Fusion.

(a) Spondylosyndesis--spinal fusion.

(b) Arthrodesis--fusion of a joint to produce ankylosis (immobility and consolidation of joint).

(2) Stabilization.

Tenodesis--suture of a tendon to a skeletal attachment.

e. **Pexy.**

(1) Fixation.

(a) Nephropexy--fixation of a movable kidney; performed to correct nephroptosis (downward displacement of the kidney).

(b) Scapulopexy--fixation of the scapula.

(c) Splenopexy--fixation of the spleen.

(d) Colpopexy--fixation of a relaxed vagina to the abdominal wall.

(e) Orchiopexy--fixation into the scrotum of an undescended testicle.

(2) Suspension.

Hysteropexy--suspension of the uterus.

2-9. DESTRUCTION PROCEDURES

a. **Discussion.** These are surgical procedures that involve a breaking down of tissues.

b. **Clasis.** Fracture or refracture.

Osteoclasis--refracture of bone.

c. **Tripsy.** Crush.

Neurotripsy--crushing of a nerve.

d. **Lysis.** Free (from adhesions).

(1) Neurolysis--freeing of a nerve.

(2) Pericardiolysis--freeing of the pericardium.

e. **Other Procedures.**

(1) Cauterization (destruction of tissue with heat, electricity, or chemical action).

Cauterization of cut blood vessels to seal them off and prevent further bleeding.

(2) Fulguration (destruction of tissue with high-frequency electric sparks).

Destruction of a lesion (such as ulcerated tissue) of the head, neck, trunk, or the extremities by fulguration.

(3) Diathermy (heating of tissue with high-frequency electromagnetic radiation).

Cyclodiathermy--destruction of a portion of the ciliary body of the eye by diathermy; may be performed in the treatment of glaucoma (condition of the eye characterized by increased intraocular pressure).

(4) Debridement (removal of contamination, contaminated tissue, and unhealthy tissue).

Debridement--of a wound of the head, neck, trunk, or limbs.

2-10. SUTURING PROCEDURES

a. **Discussion.** Suturing operations are those in which tissue is approximated (brought together) and stitched using suture material (such as silk suture, surgical gut suture, wire suture, and so forth).

b. **Suffix.** The suffix used to denote suturing operations is -rrhaphy. Some examples of rrhaphy procedures are listed in Table 2-2.

2-11. MANIPULATION PROCEDURES

a. **Discussion.** Manipulative procedures are those in which a condition is corrected by handling and maneuvering the disordered part. Terms used to indicate such procedures are as follows:

(1) Dilatation--the enlargement of a part by the use of an instrument.

(2) Closed reduction--the alignment of a fractured bone without making an incision.

Procedure	Site
Capsulorrhaphy	-suturing of a joint capsule.
Myorrhaphy	-suturing of muscle.
Tenorrhaphy	-suturing of a tendon.
Fasciorrhaphy	-suturing of a fascia.
Neurorrhaphy	-suturing of a nerve.
Blepharorrhaphy	-suturing of an eyelid.
Glossorrhaphy	-suturing of the tongue.
Laryngorrhaphy	-suturing of the larynx.
Cardiorrhaphy	-suturing of the heart.
Arteriorrhaphy	-suturing of an artery.
Gastrorrhaphy	-suturing of the stomach.
Cystorrhaphy	-suturing of the urinary bladder.
Herniorrhaphy	-repair of a hernia.
Colporrhaphy	-suturing of the vagina.
Trachelorrhaphy	-suturing of the uterine cervix.

Table 2-2. Suturing procedures.

(3) Open reduction--the alignment of a fractured bone through an incision.

(4) Application--the putting of materials on the patient (sometimes this requires the maneuvering of a part, such as in the application of a plaster cast).

b. **Procedure.**

(1) Dilatation --of esophagus.

--of anal sphincter.

--of urethra.

--of uterine cervix.

(2) Reduction.

(a) Open --open reduction of femur.

--open reduction of dislocated hip joint.

(b) Closed --closed reduction of humerus.

--closed reduction of dislocated ankle joint.

(3) Application--of plaster cast to right forearm.

Section II. THE OPERATING ROOM TEAM

2-12. INTRODUCTION

a. **Discussion.**

(1) The operating room team consists of all members of the OR staff. As an example, the team includes the OR specialist who usually performs the patient's skin preparation the day before surgery, the specialist who put up the packs that are used for the operation, the specialist (or the AN Officer) who selects the set of instruments, and the specialist who sterilizes the supplies used for the surgery. Other team members who may not necessarily be in an OR during an operation are the Chief of Department of Surgery, the Chief of Anesthesiology and Operative Services, the OR Supervisor, and the noncommissioned officer In charge (NCOIC). The surgical team is the group of people in the immediate area during a surgical procedure. This includes the surgeon and one or more assistants (depending on the complexity of the case), the anesthetist, the nurse or secialist performing the scrub duties, and the nurse or specialist performing circulating duties. All team members work together to accomplish the best possible care of the patient. Every job performed in the OR--no matter how small--contributes to the welfare of the patient, and no job is so important that it alone accounts for the recovery of the patient.

(2) Knowledge of the nature of the duties of OR team members as well as their relationships with each other is essential to the OR specialist because without such knowledge he cannot fully appreciate what is required of him. Figure 2-1 indicates the line of authority for the or. NOTE: The hospital commander, the chief of professional services, and the chief, department of nursing are not considered members of the OR team.

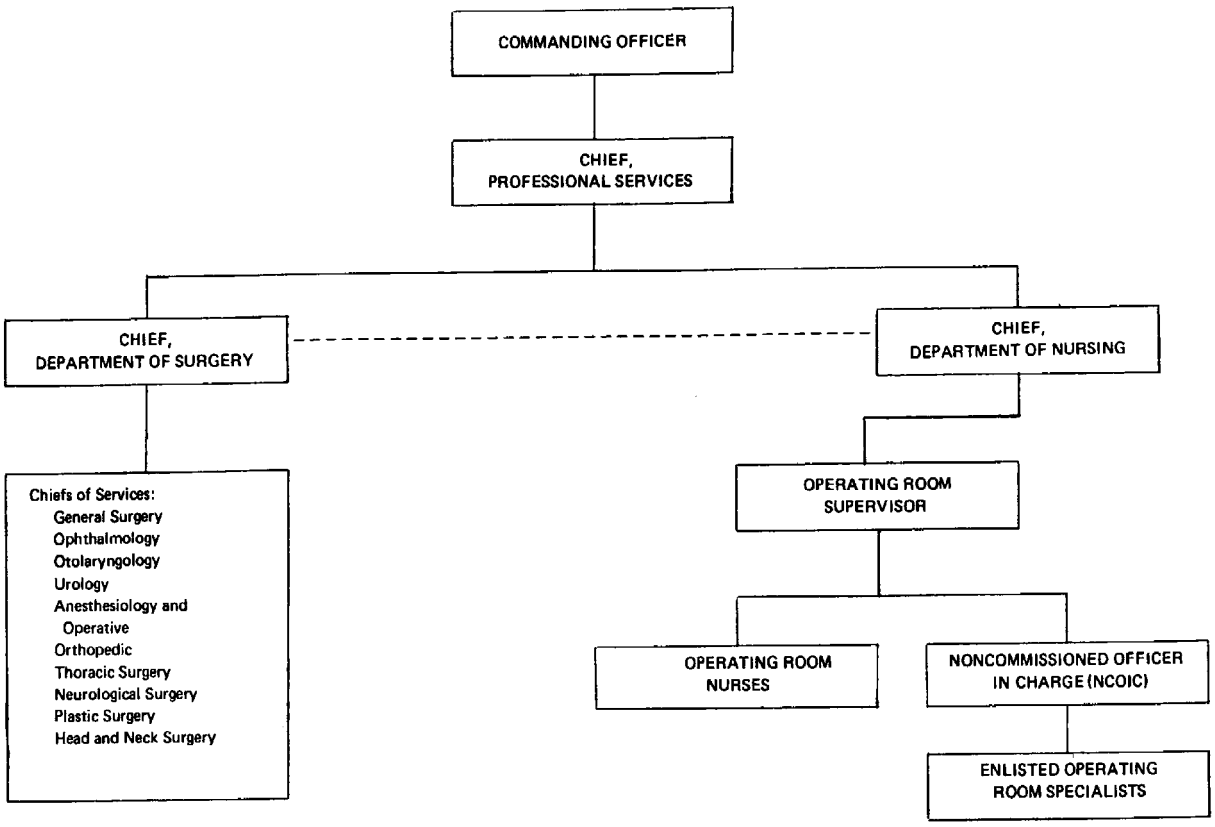


Figure 2-1. Line of authority for the OR personnel in a typical US Army hospital.

b. **Professional and Nonprofessional Team Members**.

(1) The professional members of the team include Medical Corps (MC) Officers and Army Nurse Corps (AN) Officers, as well as any civilian medical doctors and nurses assigned (see paragraphs 2-13 through 2-16).

(2) The nonprofessional team members include the NCOIC, the Enlisted specialist, and civilian technicians.

2-13. CHIEF, DEPARTMENT OF SURGERY

The Chief, Department of Surgery (or Chief of Surgery) is a general surgeon of the Medical Corps and is responsible for a broad range of functions, as described below.

a. **Overall Responsibilities.** The Chief of Surgery is responsible for the diagnosis, the medical care and treatment, and the proper disposition of patients assigned or referred to the department of surgery. In addition, he has various other responsibilities, including administrative duties related to the MC Officers assigned to the department of surgery.

b. **Responsibilities Related to Each Surgical Service.** The chief of each surgical service (see figure 2-1) is accountable to the Chief, Department of Surgery, for the performance of patient care and treatment and also for the performance of certain other functions in the management of patient care, such as the appropriate maintenance of records. Within each surgical service are MC Officer personnel who may be classified in one of the following groups:

(1) Those certified in specialties by accrediting boards.

(2) Those in various stages of training as residents.

(3) Those in an internship program.

2-14. THE SURGEON

The Surgeon is the MC Officer in charge of the treatment given to the patient during the course of an operation. The surgeon may be assisted by other medical officers in addition to AN Officers and OR specialists assigned to the case.

2-15. CHIEF, ANESTHESIOLOGY AND OPERATIVE SERVICES

a. **Discussion.**

(1) The Chief of Anesthesiology and Operative Services (see figure 2-1) is an MC Officer certified in the specialty of anesthesiology. He is responsible for the administration of all anesthetics except when local anesthesia is given by the surgeon. In addition, he is responsible for the performance of certain other delegated duties.

(2) The Chief of Surgery delegates numerous duties to the Chief of Anesthesiology such as some of the supervision and schedule planning (OR schedule).

b. **Personnel Assigned.** The personnel assigned to the Chief of Anesthesiology will depend upon whether or not an installation has an anesthesiology-training program. If it has such a program, the personnel assigned will be resident medical officers in anesthesiology, MC Officer interns who rotate through the department, AN anesthetists, and AN students of anesthesiology.

(1) In those Army-type hospitals not conducting training in anesthesiology, the anesthesiology and operative services may consist of the Chief, Anesthesiology and Operative services, and one or more AN anesthetists.

(2) An OR specialist may be assigned directly to the anesthesiology service where he may assist in positioning and transporting patients and assist the anesthesiologist as directed in handling his equipment. When no specialist is assigned to the anesthesiology service, the OR specialist serving as circulator is responsible for assisting in the performance of these and other tasks as directed by the anesthesiologist or anesthetist. NOTE: An MC Officer who is certified as a specialist in the administration of anesthetics is an anesthesiologist. Other persons who administer anesthetics--such as the AN Officer especially trained in anesthesiology, and the surgeon when he administers a local anesthetic--are appropriately called anesthetists. However, in actual practice in the surgical suite, the person who gives the anesthetic is usually referred to as the anesthetist, even though he may be certified as an anesthesiologist.

2-16. OPERATING ROOM SUPERVISOR

a. **Responsibility.** The OR Supervisor (see figure 2-1) (an AN Officer) is responsible for all of the nursing functions performed by the OR personnel. He makes out the time schedule and the duty assignment roster for the OR staff nurses, both military and civilian, within the operating suite. He is accountable to the Chief, Department of Nursing, for the nursing care given by AN Officers, enlisted OR specialists, and civilians. He makes out the OR schedule In coordination with the Chief of Surgery and the Chief of Anesthesiology and operative services. He also formulates policy for nursing service personnel working in the OR.

b. **Assistants.** The professional staff nurses function under the direction and supervision of the OR Supervisor. They perform the functional duties of, and are assistants to, the OR Supervisor. Since the supervisor may not be in the OR or suite at all times, the staff nurses represent the supervisor during surgical procedures and assist in maintaining high standards of patient care.

2-17. NONCOMMISSIONED OFFICER IN CHARGE

a. **Discussion.** The noncommissioned officer in charge, an enlisted OR specialist, supervises the nonprofessional personnel and maintains the physical environment of the OR. He reports directly to the OR supervisor (see figure 2-1).

b. **Duties.** Among his varied duties are those related to supervising the work and helping to evaluate the performance of nonprofessional personnel and conferring with the OR supervisor and with instructors (at the hospitals having training programs) when nursing service personnel time schedules (see figure 2-2) and OR schedules (see figure 2-3) are prepared. He assists with the orientation of enlisted personnel.

(1) In supervising the work, the NCOIC performs duties concerned with the smooth functioning of the surgical suite--example, he ensures that the equipment needed for a case is at hand and that preparation for operations is begun early enough so that the operations will not be delayed.

(2) The maintenance of the physical environment necessitates such duties as: ordering supplies and equipment, seeing that the surgical suite and furnishings are cleaned properly, and arranging for a periodic inspection and repair of OR equipment.

2-18. OPERATING ROOM SPECIALIST

a. **Discussion.** The OR specialist is directly responsible to the NCOIC (see figure 2-1) and to the professional personnel with whom he works. The specialist may be assigned duties directly related to the performance of an operation, as the scrub or as the circulator. He may be assigned to the workroom, the instrument room, the anesthesia section, or to any other area within the surgical suite. Specific tasks, which may be revised in accordance with local policy, involved in the performance of these duties are set forth in b and c below.

b. **Scrub Duties.** Scrub is the term used to designate the member of the surgical team who assists the surgeon by providing sterile instruments, sutures, and supplies within the sterile field. When assigned as the "scrub," the specialist dons conductive shoes, greens (pants and shirt), cap, and mask. He then scrubs his hands and arms in accordance with local policy; he dons sterile gown and gloves (refer to figures 1-30 and 1-31) and helps other members of the "sterile" team to do so. The

NURSING SERVICE PERSONNEL TIME SCHEDULE
For use of this form, see AR 40-407;
the proponent agency is the Office of The Surgeon General.

DATES (Inclusive) OF PERIOD COVERED
4 Aug - 10 Aug 19XX

TITLE	LAST NAME	DUTY	DUTY TIME, GLASS TIME, OR OFF-DUTY STATUS						
			SUN	MON	TUE	WED	THURS	FRI	SAT
LTC	Jones, Donald	ORS	DO	1	1	1	1	1	DO
MAJ	Johnson, Mary	HN	DO	1	1	1	1	1	DO
CPT	Stevens, Howard	66E	C	1	DO	C	DO	1	C
CPT	Jenkins, Lisa	66E	DO	C	1	1	C	1	DO
CPT	Young, Ted	66E	DO	1	C	1	1	C	DO
SFC	Powell, Robert	NCOIC	DO	1	1	1	1	1	DO
SFC	Osburn, James	ANCOIC	DO	1	1	1	1	1	DO
SSG	Everett, Jeff	91D	DO	1	1	1	1	1	DO
SSG	Ramsey, Albert	91D	DO	2	2	2	2	2	DO
SGT	Baxter, Ralph	91D	C	DO	1	1	1	C	DO
SGT	James, Rose	91D	DO	2	2	2	2	2	DO
SGT	Parker, Ann	91D	DO	C	DO	1	1	1	C
SPC	Sledge, Joe	91D	DO	2	2	2	2	2	DO
PFC	Smith, John	91D	DO	1	C	DO	1	1	DO
PFC	Townsend, Carl	91D	DO	1	1	C	DO	1	DO
PV1	Tovar, Janice	91D	DO	1	1	1	C	DO	DO
GS4	Gray, Cathy	N Aide	DO	1	1	1	1	1	DO
GS4	Durham, David	N Aide	DO	2	2	2	2	2	DO

SIGNATURE OF HEAD NURSE
Mary Johnson, MAJ, AN *Mary Johnson, Maj, AN*

WARD
OR

INSTRUCTIONS

List professional personnel first and then nonprofessional.
In column under "TITLE" enter title, e.g., Maj., Capt., Lt., Sgt., Pvt., Mr., Mrs., Miss
Entries for "DUTY" and for "OFF-DUTY STATUS" will be symbolized as follows:

"DUTY" symbols
HN - Head nurse
ASST. HN - Asst. head nurse
GEN. DUTY - General duty
CL. T - Clinical technician
WM - Ward master

"OFF-DUTY STATUS" symbols
DO - Day off
LV - Leave
SK - Sick leave
HT - Holiday time

DA Form 1 JUN 72 3872 REPLACES DA FORM 3-98, 1 JAN 84, WHICH WILL BE USED. ☆ U.S. GPO: 1973-527-002

Figure 2-2. Typical nursing services personnel time schedule.

OPERATING ROOM SCHEDULE

HOSPITAL: Battle Army Community Hospital

DATE: 30 MAY 19XX

TIME & ROOM	PATIENT'S NAME STATUS AGE RELIGION	PATIENT'S REGISTER NUMBER & SSN + PREFIX	NURSING UNIT FROM	NURSING UNIT IN	OPERATION	SURGEONS	NURSING STAFF	ANESTHETIST	ANESTHETIC BLOOD (UNITS)
RMI 0800	SMITH, JOHN R. SGT 32 yrs	458621 481-48-6062	21	REC	RADICAL NECK DISSECTION WITH STSG DS RT. THIGH	DR. JONES DR. BLACK DR. FERRIS	SFC ROBIN (S) SPC JOHNSON (C)	MAJ HARRIS	GENERAL ENDO T. 1000cc
TF	ROBERTS, WM. S. SGT 28 yrs	432065 240-74-3037	21	REC	EXC. KELOID FOREARM RT.	DR. BLACK DR. FERRIS	SFC ROBIN (S) SPC JOHNSON (C)	DR. BLACK	BRACHIAL BLOCK
TF	NORRIS, SALLY C-D 16 yrs	465601 222-20-0910D	10	10	EXC. SEBACEOUS CYST AURICULAR LT	DR. BLACK DR. FERRIS	SPC JOHNSON (S) SFC ROBIN (C)	DR. BLACK	LOCAL
RM II 0800	JOHNSON, RALPH MSG Ret 50 yrs	416824 833-43-3624	18	REC	NEPHROLITHOTOMY RT.	DR. FERRIS DR. BLACK	CPT KANKS (S) PFC BLAND (S) SGT MEYER (C)	MAJ BLAKE	GENERAL ENDO T. 1000ml
RM III 0800	ROBINSON, JOHN C-D 10 yrs	467123 916-90-0427D	11	REC	T & A	DR. BRENNAN DR. JACKSON DR. STEVENS	SGT BROWN (S) SSG MILLER (C)	CPT COOPER	OD ETHER
0845	FELLOWS, JAMES PFC 20 yrs	467228 408-59-4520	12	12	SEPTECTOMY	DR. HANSEN DR. BENSON	SGT BROWN (S) SSG MILLER (C)	SURGEON	LOCAL & TOPICAL
RM IV 0800	BOWMAN, MARY C-D 24 yrs	467221 763-29-2603D	14	REC	C-SECTION	DR. SULLIVAN DR. ASHBY DR. KLEINE	CPT REED (S) PFC KING (C) SGT SMITH (C)	CPT MAIER	SPINAL

DD FORM 1923 1 SEP 73 (AUTOMATED) REPLACES DA FORM 3285, WHICH IS OBSOLETE

Figure 2-3. Operating Room Schedule.

scrub arranges the sterile supplies and assumes responsibility for the sterility of the items for use within the operative field both before and during the surgical procedure. His routine tasks are to:

(1) Check DD Form 1923, OR Schedule.

(2) Perform a surgical scrub.

(3) Put on sterile gown and gloves.

(4) Check internal sterilization indicator controls.

(5) Prepare prep set first.

(6) Separate and arrange sterile basins.

(7) Arrange linen on double-ring stand next to sterile basin.

(8) Drape Mayo stand.

(9) Arrange instruments and sterile supplies on back table and Mayo tray.

(10) Prepare suture material.

(11) Count sponges with circulator (witnessed by registered nurse).

(12) Gown and glove the surgeon.

(13) Assist surgeon with draping.

(14) When ready to begin assisting the surgeon, move Mayo stand into position.

(15) Pass instruments, sponges, supplies, and sutures to surgeon.

(16) Anticipate the surgeon's needs.

(17) Remove loose sponges from operative area as necessary.

(18) Recount sponges with circulator (witnessed by registered nurse).

(19) Assist surgeon with dressing sponges.

(20) Move sterile tables away from operating table.

(21) Remain sterile until patient leaves the room.

(22) Prepare instruments and supplies, used and unused, for clean up.

(23) Remove supplies from room and put in proper place.

(24) Assist circulator in preparing for next operation.

c. **Circulating Duties.** The circulator is the member of the surgical team who works outside the sterile field, gives patient care, procedures needed supplies, and assists surgical team members in performing the operation safely and expeditiously. He dons conductive shoes, cap, mask, and greens (pants and shirt). The specialist assigned to circulate assembles and brings into the room all packs, supplies, and equipment needed for the case; he ties the gowns for "sterile" members of the team and sets up nonsterile items of equipment; he also performs other nonsterile duties. His routine tasks are to:

(1) Check DD Form 1923, OR Schedule.

(2) Damp dust all equipment and wet-vacuum floor prior to a surgical procedure.

(3) Check mechanical and electrical equipment.

(4) Arrange furniture in functional order.

(5) Assemble, arrange, and open outer and inner wrappers of sterile supplies. Check package integrity, expiration date, and appearance of the indicating tape.

(6) Assist with gowning of scrub and surgeons.

(7) Pour sterile solutions: water, normal saline, and antibacterial solutions; avoid splashing. Figure 1-22 illustrates commercially prepared and hospital prepared irrigating solutions.

(8) Pass knife blades and suture to scrub.

(9) Pass additional sterile supplies to scrub as needed.

(10) Take sponge count with scrub (must be witnessed by a registered nurse). Record on sponge count board.

(11) Assist anesthetist with moving and positioning patient.

(12) Place the restraining strap properly.

(13) Assist surgeon with prep.

(a) Check with anesthetist before touching patient.

(b) Expose area--avoid unnecessary exposure of the patient.

(c) Place linen protectors to absorb excess moisture.

(d) Focus light.

(e) Removes surgeon's gloves after prep.

(f) Replace kick bucket liner.

(g) Move liner containing soiled prep sponges to outer circle of room.

(h) Do not remove sponges, linen, or trash from room.

(14) Assist anesthetist in securing drapes.

(15) Attach suction tubing to machine.

(16) Remain alert to needs of the scrub.

(17) Assist scrub with arrangement of draped furniture.

(18) Position kick buckets for easy access.

(19) Focus light over operative area.

(20) Prepare specimen for laboratory.

(21) Prepare adhesive strips for dressing.

(22) Verify sponge count with scrub (must also be witnessed by Registered Nurse).

(23) Pass dressing sponges to scrub.

(24) Remove and check drapes for instruments and supplies before discarding into hamper.

(25) Assist in moving patient to litter and secure with straps.

(26) Clean the room and prepare for next case.

d. **Other Duties.** In addition to understanding and performing tasks related to his assignment as the scrub or the circulator for an operation, the OR specialist is required to understand and participate in tasks concerned with preparing the patient for surgery (surgical "prep"), assembling packs for use during surgery, assembling instrument sets, and sterilizing supplies and equipment. The specialist is required to practice personal hygiene measures to prevent the spread of pathogenic organisms; he is also required to demonstrate a high standard of personal ethics, as well as practicing such medical ethics as upholding the patient's right to privacy.

e. **Effective Duties.** In addition to providing effective care of the patient, the OR specialist is responsible for effective performance with regard to the care, preparation, and maintenance of sterile and nonsterile supplies. He is obliged to continue to learn and progress in skill of performing both the simple and more complex procedures. When in doubt, he should not act but seek advice from the proper source.

Section III. ATTRIBUTES NECESSARY IN TEAM MEMBERS

2-19. PERSONAL HYGIENE

Good personal hygiene is of particular importance, since it helps to protect the patient and team members from getting an infection. The OR specialist should shampoo his hair daily because both hair and dandruff harbor bacteria. He should shower at least once a day with antibacterial soap, use a deodorant, and put on clean underwear and socks after each shower. Oral hygiene is also important for the control of both bacteria and offensive odors. The specialist must give special attention to his hands--he should wash and scrub them frequently, and he should keep his nails well trimmed. He should have two pairs of shoes for use in the OR suite and should wear them alternately, allowing one pair to air while wearing the other pair. The specialist should not wear scrub clothes outside of the surgical suite. It should be against regulations for personnel to enter the OR who have infections of the nose or throat, who are known to be carriers of infectious diseases, or who have open sores.

2-20. ETHICAL AND PERSONAL RESPONSIBILITIES

a. **Discussion.** Ethics can be defined as the study of standards of conduct and moral judgment. It is a system or code of morals of a particular profession. Medical ethics can be guided by the principle--render service to humanity with full respect for dignity of man.

b. **Personal.** Personal characteristics of honesty, dependability, and integrity are absolutely essential. Each team member is dependent upon and places his confidence in the other team members for the correct performance of duties. The development of a "surgical conscience" is therefore necessary for the OR specialist. The specialist should also possess a desire to learn and to progress from knowledge of simple procedures to more complicated ones. He should be energetic and determined in his efforts to improve his skill in the performance of all his tasks. Skills may be improved through practice, with guidance as necessary by qualified personnel.

c. **Medical.** The OR specialist has a moral obligation to safeguard the patient against gossip in or outside of the OR. He should not mention a patient's name and the operative procedure performed to personnel not assigned to the surgical suite; and he should discuss such information with other team members only to the extent necessary in the accomplishment of the work. Another medical aspect of both ethical and moral responsibilities concerns events that take place within the surgical suite. Such events should not be discussed outside the OR. The OR specialist should not reveal confidences and trusts or deficiencies observed in the character of the patient.

d. **Legal.** The work of an OR specialist also entails legal as well as moral responsibilities. When he is unsure of what to do, he should consult the NCOIC, a nurse, or a medical officer.

2-21. MAINTENANCE OF EFFECTIVE RELATIONSHIPS WITH MEMBERS OF THE OPERATING TEAM

Optimum care of the patient is not possible unless effective working relationships are maintained among members of the OR team. The specialist contributes toward the maintenance of such a relationship by knowing his job and performing efficiently, abiding by departmental policies, and displaying a positive attitude toward both his work and his fellow team members.

2-22. LEGAL CONSIDERATIONS

The number of medical malpractice cases has increased substantially in the past few years, both in the civilian and in the military sectors. Liability for medical malpractice in the military is determined under the Federal Tort Claims Act. Under that act, individuals may sue the Federal Government for the negligent acts of Federal employees who are performing within the scope of their duties or employment. The individual military medical care provider is protected from any personal liability by the Gonzales Bill (10 USC 1089) enacted in 1976, which makes the Federal Government solely responsible for the defense and payment of medical malpractice claims. While the individual service member will not have to pay any money judgment for medical malpractice, the service member may be liable for criminal acts such as negligent homicide or involuntary manslaughter.

2-23. LEGAL INTERPRETATION

a. **General.** The liability of the Federal Government under the Federal Tort Claims Act for medical malpractice is decided by application of the law of the state where the incident occurred. It is true that the law and court decisions vary from state to state, but the trend is to hold all medical care providers to a high standard of care.

NOTE: You are expected to utilize your superior knowledge in performing your duties. You must always carry them out in a manner that meets the high standards of the Army Medical Department (AMEDD).

b. **Welfare and Safety of the Patient.** All instruction of AMEDD personnel concerning care of the patient emphasizes the welfare and safety of the patient. This is the principle around which nursing care is built. Safe care of the patient results in safety for those responsible for his care.

c. **Malpractice.** Negligence is the failure to exercise due care. Due care is further defined as the action that a reasonable and prudent person would perform under the same or similar circumstances. Due care takes into consideration the training, experience, education, and capabilities of each person. Negligence of professionals, such as medical professionals, is termed malpractice.

d. **Prevention of Lawsuits.** Most mistakes or accidents are preventable. Some are so slight that the patients are never aware of them; others can prove fatal. Even if a patient himself is at fault, those caring for him suffer great remorse. You should be cognizant of many hazards and know the safeguards.

2-24. POTENTIAL LEGAL INVOLVEMENTS

a. **Loss of Sponges.** Loss of sponges is a frequent cause of lawsuits. In a few states, the responsibility for accounting for all sponges before closure rests with the surgeon. However, the law in most states is that each member of the surgical team is responsible for his specific duties. Therefore, in a case where the surgeon has performed correctly but a sponge is left in the incision, the circulator or scrub may be held responsible.

b. **Burns.** Burns are another frequent cause of lawsuits. A burn may occur from the use of a hot instrument such as a mouth gag or a heavy retractor. The scrub should have available a basin of cold saline solution for cooling instruments and should cool the instruments when necessary before handing them to the surgeon. A burn may also occur from a light, a thermal blanket, or an electro surgical inactive electrode.

c. **Falling.** Falls are another frequent cause of lawsuits. Observe the usual safeguards for children or disoriented or sedated persons, whether in wheelchairs, in bed, or on the operating table. Use special care when patients are moved from bed to table and back to bed again, as well as those being moved about on litters or wheelchairs.

d. **Patient Identity.** Many serious situations may arise in the hospital as the result of carelessness in checking patient identity. The right medication or treatment for the wrong patient may or may not be serious, but sometimes takes on great proportions. Be sure of the patient's identity.

e. **Unconscious Patients.** Since a great number of patients in the OR receive a general anesthetic and are therefore unconscious, great vigilance is needed. If the patient is injured while unconscious, negligence may be presumed, which may require those caring for the patient to show that due care was followed during the entire period of unconsciousness.

f. **Aseptic Technique.** Each person on the surgical team must take the utmost care to carry out strict asepsis. Dust control, proper cleaning of floors and furniture, and sterilization of instruments and equipment are essential, along with scrub, mask, glove, and gown technique. Any break in asepsis at any point nullifies all the care taken in other ways.

g. **Drugs.** The same strict rules observed on the ward in regard to drugs must be practiced in the OR. The scrub frequently has dangerous drugs such as phenol or cocaine on his table. Special care must be taken to ensure that these are not used improperly. Each drug used is checked by two persons as it is prepared, and the scrub repeats the name of the drug to the surgeon as it is handed to him.

h. **Abandonment.** A patient left alone or a child unguarded may injure himself by an electric shock, burns, drugs, lacerations, falls, or a variety of other things. The sources of such injuries should be removed whenever possible and a patient who might injure himself carefully watched.

i. **Explosions.** Great care must be taken in the OR to prevent explosions.

j. **Tissue Specimens.** The loss of a biopsy specimen could mean the possibility of a second surgical procedure to obtain another. Improperly labeled specimens could mean a mistaken diagnosis, with possible critical involvement for two patients. The loss of a specimen could be vital if diagnosis is not made and proper treatment not given. A report from pathology on a specimen is a permanent record on the patient's chart that a certain piece of tissue or a stone has been removed.

k. **Foreign Bodies.** Care for these according to local policy. They often have legal significance outside the hospital, and frequently are claimed by civilian or military police. A receipt should be required of anyone taking them.

l. **Consent for Operation.** As a rule, witnessed written consent for an operation or procedure is signed by the patient before the surgery or procedure is performed. The patient must understand the details of the agreement fully. If the patient is a minor, unconscious, incompetent, or intoxicated, the nearest of kin or some other authorized person must sign. If a true emergency exists and no one else is available to sign the consent, the Judge Advocate's Office should be contacted. When this is not possible, the hospital administration may give permission for the procedure or surgery.

m. **Right to Privacy.** This right exists either by law or by custom. Hospital charts and records, X-rays, and photographs are for use by the surgeon and other hospital personnel who are directly concerned with that patient's care. Suits can be, and have been, brought by patients for violation of this right. Unauthorized persons are not permitted to observe operative procedures. Suits have been brought by patients when unauthorized persons, out of curiosity, have been permitted to witness procedures of interest only to professional persons.

n. **Confidential Information.** You have a moral and legal obligation to hold in confidence any information gained from the patient during medical care. However, as there is no medical privilege in the military, you may be required to divulge confidential information upon request by proper authority.

o. **Personal Property.** Generally, the patient comes to the OR without any personal property. However, you should check to make sure that the patient has no eyeglasses, dentures, contact lenses, watches, wigs, or glass eyes that should be removed before surgery. Be sure to follow locally prescribed procedure in handling these articles. Be sure to obtain a receipt for any such articles when they are given to ward personnel for safekeeping. A patient who has hair clipped owns the hair that is removed, and you are responsible for its safekeeping also.

p. **Records.** Inaccurate record can be a source of legal action against the person responsible.

q. **Defective Equipment.** Operating room specialists are responsible for certain equipment checks. Any defect that was noticeable and remained unrepaired has legal connotations in case of an accident. Be sure you can prove that equipment defects were properly reported.

2-25. THE OPERATING ROOM SPECIALIST AND BEREAVEMENT

Another consideration that must be taken into account is the OR specialist's handling of bereavement. Any person who works in a hospital may be called upon to deal with a bereaved person. The dynamics of bereavement and grief are essentially the same whether the loss is of a person, a limb, or simply of the powers that make one able to maintain his normal routine. While these are the same in their dynamics, there is obviously a variation in the depth of the experience. Whatever the depth of loss, the OR specialist may find himself frequently in a position of helping people cope with grief in a constructive way.

2-26. DYNAMICS OF GRIEF

If one is to integrate a loss, he must come to terms with his objective loss and with the threat that loss poses for his life and well being. He must also contend successfully with the fear and anger which results. There are both positive and negative aspects of every relationship so that in bereavement, both positive and negative feelings will be present. The "unacceptable" feelings of anger toward a person who has been valued, loved, and now lost may make the expression of grief a very difficult task, complicating it with guilt. Also, a person may be afraid of any deep feelings. Although grief is trying, it is a healing phenomenon. It is our way of being separated from someone or something with which our life is intimately entwined. It involves the process of withdrawing ties and establishing new ones. All the rituals surrounding death and burial are designed to help us do this important work of mourning.

2-27. HELPING THE BEREAVED

a. One central question concerns the expression of feelings. Most people can express some of their feelings, but still deny and repress others. Some will recoil from any strong feelings. After the initial period of shock, these feelings will have to be expressed or the person's well being may be gravely compromised.

b. Frequently, it may be important to consider whether the person feels adequate to face life and go on, whether he feels valuable or worthless, or whether he is optimistic or pessimistic about the future. If he feels that things will work out and that he is a person of value who is adequate in dealing with life, he is more likely to be able to abandon himself to grief and do the work of mourning without panic. It is also important for him to see that his pain has purpose and is useful in some way.

c. The bereaved person should bear the responsibility for making decisions and choices, although he may need considerable support. Making decisions about funeral arrangements helps the bereaved to face the fact of death.

2-28. MEDICAL PERSONNEL AND HOSPITAL AS SCAPEGOATS

a. There are certain cases where the bereaved may justifiably blame the doctors or the hospital and its staff for the loss of a patient. On the other hand, there are a great many cases in which the doctors and hospital personnel have done all that was reasonably possible to save a patient, yet are vehemently blamed for his death. A malpractice suit may even result. This can be a baffling experience unless the dynamics underlying this response are understood.

b. As mentioned above, relationships are never all positive or all negative. Given the ambivalence of relationships and our natural tendency to deny negative aspects of relationship, death of a loved and valued person brings about a critical situation. Anger because the person has left through death is added to the unresolved anger in the relationship, and at the same time expression of this anger becomes unacceptable. In their deep need to express this kind of anger, people often transfer it to the doctor and hospital.

Section IV. POLICIES AND INFORMATION ON FILE

2-29. INTRODUCTION

Several sources of information are kept within the surgical suite and are available to the specialist. These sources or references, discussed in the paragraphs to follow, make up the local policy for the suite. The specialist should, therefore, know where these references are kept and refer to them as often as necessary.

2-30. PROCEDURE MANUAL

The procedure manual sets forth step-by-step instructions for the performance of tasks within the surgical suite. Also, the administrative policies for the suite are often included in the procedure manual. The specialist may refer to the procedure manual at any time to check the local policy for the performance of assigned tasks.

2-31. INSTRUMENT CARD FILE

a. **Discussion.** Instrument cards contain information as to the "basic" instruments and other items used for the various kinds of operations (such as appendectomy, cholecystectomy, tonsillectomy, and so forth). The selection of instruments for a given operation is made in accordance with information on the appropriate card in this file.

b. **Basic Instruments.** The instruments with which an operation may be performed are classified as the basic instruments (or basic set) for that operation. Therefore, each card in this file has recorded on it the name of the operation, the names of the instruments needed, the sizes (for instruments available in different sizes), and the number of each kind of instrument to be included.

c. **Other Items.** Items not considered instruments (such as drains, safety pins, and so forth) but needed to perform the operation are also listed on the instrument card.

2-32. SURGEON'S PREFERENCE CARDS (SUTURE CARDS)

The surgeon's preference cards contain information as to the types of sutures, needles, and stitches required for a procedure. A card is on file for each surgeon for each kind of operation that he performs. The surgeon's glove size may also be included on the card as well as the surgeon's preference for an instrument not included in the basic set.

Section V. SELECTED FORMS USED IN THE OPERATING ROOM

2-33. INTRODUCTION

The forms selected for discussion are those that provide basic information to the specialist concerning his work in the OR suite. The specialist checks the OR Schedule to identify the operations to which he is assigned. The specialist may obtain detailed information for the performance of his assigned tasks by referring to the procedure manual. The assignment roster may be prepared for the entire week, but the specialist should check it at least twice daily because a change in assignments may have been entered.

2-34. NURSING SERVICE PERSONNEL TIME SCHEDULE

a. **Discussion.** DA Form 3872, Nursing Service Personnel Time Schedule (see figure 2-2) is used to list the days on duty and off duty for all OR personnel. The NCOIC assists in the preparation of the time schedule for the OR specialists. The schedule is posted for one week at a time and is usually prepared several weeks in advance.

b. **Need for a Time Schedule.** The use of a time schedule enables the personnel responsible to plan for the adequate coverage of the suite at all times and enables personnel assigned to make plans ahead of time. If the hospital has a "call system" for coverage after normal duty hours, the time schedule should indicate the personnel who are "on call" for the week.

c. **Coverage After Normal Duty Hours.** All surgical suites must plan for adequate coverage in the event that emergency surgery must be performed after normal duty hours. In large OR suites, or in a hospital where a great deal of emergency work is done, coverage is provided by scheduling personnel on shifts around the clock. In surgical suites not using shifts, personnel should be placed "on call" to provide coverage for emergency operations. Some installations assign call personnel as well as having shifts. Persons on call must be highly skilled in all kinds of surgery since the types of emergency operations cannot be predetermined. The specialist taking call must be available within a very short time and must inform the person responsible for calling him of his whereabouts at all times. Local policy will indicate whether personnel taking call are to sleep in a room in the hospital or in quarters. The shifts and call duty are rotated frequently so that a person does not work the same shift all the time or take excessive call.

d. **Planning for the Time Schedule.** The time schedule is planned and prepared in order to provide an opportunity for the specialist to have learning experiences. This is accomplished by scheduling a person who needs further training to be on duty with a person having the appropriate training and experience. Such considerations make the planning and the preparation of the time schedule a difficult task.

e. **Operating Room Specialist's Requests Concerning Time Off.** The OR specialist should write his routine requests for specific days off duty, for passes, and for leaves, and he should give such requests to the NCOIC before the time schedule is prepared. The specialist should not ask to have his time changed after the schedule has been prepared unless he has a true emergency. He should make all requests concerning his time to the NCOIC.

2-35. THE OPERATING ROOM SCHEDULE

a. **Discussion.** DD Form 1923, ORSchedule (see figure 2-3) is used for one day's surgery. It contains the basic information needed by the scrub and the circulator in the planning and organization of their work for that day. In order to be able to use the information on the schedule, the specialist must know what each brief entry means in terms of his tasks as the scrub or the circulator. While studying the interpretation of the various entries on the schedule, refer to figure 2-3. NOTE: The OR schedule is distributed to all units concerned. In addition to the surgical suite, these include the surgical nursing units, the recovery room, the anesthesiology and operative service, the Chief, Department of Surgery, the commanding officer, the Chief, Department of Nursing, the Laboratory, the Department of Radiology, and the Chaplain.

b. **Room Number.** (See figure 2-3). The individual ORs are assigned to the various surgical services by the OR Supervisor in coordination with the Chief Anesthesiologist and Chiefs of Surgical Services. For example, the general surgical service may use room one on Mondays, Wednesdays, and Fridays and the urology service may use the same room on Tuesdays and Thursdays. Such an arrangement enables greater efficiency and economy in the use of the equipment required by a particular service and also lets the scrub and the circulator know ahead of time what equipment will be needed in a room on a given day of the week.

c. **Time.** (See figure 2-3). The time entered means that the incision is to be made at that hour. The patient should have been previously anesthetized, positioned, prepared, and draped. Therefore, the scrub and the circulator should perform their tasks in the preparation of the room sufficiently ahead of time in order not to delay the case. To follow means "TF" when used in this column and indicates that the room is to be prepared as quickly as possible upon completion of the preceding operation. The time required for this preparation is about 20 minutes. (A patient whose surgery is

scheduled "TF" is given the preoperative hypodermic "on call.") That is, OR personnel will notify the ward nurse to give the hypodermic about 1/2 hour before the completion of the operation preceding the "TF" operation).

d. **Patient's Grade.** (See figure 2-3). The patient's grade is inserted following his name if he is a member of the Army; the abbreviation "ret" is added for retired personnel. The term "C-D" indicates civilian dependent. The inclusion of age is important to personnel in both the OR suite and the anesthesiology service. Children are scheduled before adults to avoid excessive dehydration in the children. In addition, the instruments required for the operation will likely be different when the patient is a child than when the same operation is to be performed on an adult. As an example, a hernioplasty on a child requires fewer and smaller hemostatic forceps and scissors than does this surgery on an adult.

e. **Register Number.** (See figure 2-3). The register number is used to help identify the patient. The circulator must see that it is entered on the pathology forms so that the specimen from a patient is properly identified (if two patients have identical names, the register number may be the only accurate means of identification). In Army hospitals, the social security account number is used (in addition to the register number) to identify the patient and his clinical records.

f. **Nursing Unit.** (See figure 2-3). The column headed "NURSING UNIT" indicates the location of the patient prior to surgery as well as the nursing unit to which he will be sent upon completion of his surgery. Patients who have been given general or spinal anesthesia are sent to the recovery room. Those who have been given local or regional block anesthesia are usually returned to their original-nursing units.

g. **Operation.** (See figure 2-3). The circulator and the scrub must know the location of the operative area and the site of the incision. These are often (though not always) obvious to the specialist if he knows the definition of the operation (see paragraphs 2-1 through 2-11). For an operation that might be performed using one of several sites for the incision, the incision site should be specified immediately following the name of the operation. Once the specialist is assigned to select the instruments for the case, he obtains the instrument card (see paragraph 2-31) for that operation and assembles the items recorded on the card. The inexperienced OR specialist may need to use references for an understanding of some operations, especially those named after individuals.

(1) Normally, Dorland's Illustrated Medical Dictionary is available in every OR suite. This volume includes a brief description of operations named for the surgeon who originated or modified the procedure. These are examples: Albee's operation--for ankylosis of the hip, consisting of cutting off the upper surface of the head of the femur, and so forth; Bergenhem's operation--surgical implantation of the ureter into the rectum.

(2) Other more detailed references may also be available. Some books describe the operative procedure, the operative area, the site and kind of incision, the position, and the draping. One that includes these descriptions (and is established as an Army field manual) is Alexander's Care of Patient in Surgery. This book also lists instruments and sutures necessary for operative procedures; however, these lists are not always applicable to all hospital ORs. NOTE: Many terms pertaining to an operation are abbreviated. As an example, in the listing, (see figure 2-3), of the radical neck dissection. "STSG. DSRT. THIGH" indicates that the patient will have a split thickness skin graft and his right thigh will be used as the donor site. If the specialist assigned to scrub or circulate for an operation is uncertain of the meaning of any abbreviation of the schedule, he should ask the NCOIC or an AN Officer. Operative procedures performed on a bilateral structure should always indicate the side of the procedure. T and A (see figure 2-3) stands for tonsillectomy and adenoidectomy. C-section is the abbreviation for cesarean section.

h. **Surgeons.** (See figure 2-3). The name listed first denotes the surgeon in charge of the operation. The names that follow are other MC Officers assigned in the order of first assistant, second assistant, and so forth.

(1) The circulator. The number of surgeons listed indicates to the circulator the number of gowns necessary. The circulator also finds out the glove sizes for the MC Officers listed.

(2) The scrub. Before scrubbing up, the scrub obtains the surgeon's preference card (see paragraph 2-32) for the surgeon in charge of the operation. He follows the information on the card with regard to preparation of sutures and any special equipment listed. The scrub also determines what his position at the table should be in relation to this group--to the right or left of the surgeon and at which side of the operating table. In making this decision, the scrub considers a number of factors, including the following--the location of the operative area and any special needs imposed due to either the location or the nature of the surgery; the working habits and preference of the surgeon; the number of members of the sterile team and their tasks; and whether or not any members of the sterile team are left-handed. The scrub then sets up the Mayo stand, the back table, and the basin (ring) stand for his use in accordance with his position at the OR table. Note the grouping of the sterile tables in figure 1-30A, B, C, and D.

i. **Nursing Staff.** (See figure 2-3). The OR specialist and other OR personnel assigned to work on the cases are listed in the column headed "Nursing Staff." "Scrub" and "circulate" may be abbreviated "S" and "C." Duties of the scrub and the circulator include those set forth in paragraph 2-18. Whenever two team members are assigned to scrub, the first listed is the senior (or the more skilled) team member and the other serves as the assistant.

j. **Anesthetist.** (See figure 2-3). If the patient is to be given local infiltration anesthesia, the surgeon's name is repeated in this column, or the word "surgeon" may be entered. For anesthesia administered by a member of the anesthesiology service, the name of the anesthetist assigned for the operation (either MC or AN Officer) is entered. The circulator should put a revolving stool in place for the anesthetist (see paragraph 1-17a and figure 1-15). If the surgeon is scheduled to administer the anesthetic agent, the circulator should see that a source of oxygen is available in the room. (The gas anesthesia apparatus provides this source of oxygen unless piped-in oxygen is available.)

k. **Anesthetic.** (See figure 2-3). The information entered in this column indicates whether a local or a general anesthetic will be given, the method of administration, and often the anesthetic agent to be used. The word "endo" (an abbreviation for endotracheal) is usually added if the anesthetist is going to intubate the patient (insert a tube which provides an artificial airway into the patient's trachea by way of his nose or mouth). Additional time (15 or 20 minutes) is required for anesthetizing when a patient is to be intubated.

(1) The listing of the type of anesthetic may be of assistance in the selection of instruments. For example, an operation scheduled as "excision of keloid, right forearm" gives no information about the size of the surgical wound. If it is scheduled for local anesthesia rather than general, the specialist can safely assume that the incision will be small, to be closed without skin grafting.

(2) The letter "T" followed by a number of ml (1000, 1500 ml, and so forth) indicates that whole blood has been ordered from the laboratory and is available in the amount listed, and the patient has been typed and cross matched in anticipation of his need for a transfusion during the operative procedure.

l. **Summary.**

(1) Practice and experience will increase the student's knowledge greatly. Both the scrub and the circulator can obtain much information from the references available in the OR suite. These references include the procedure manual, instrument card file, surgeon's reference cards, the various DA Forms (especially the OR Schedule), standing operating procedures or policy file, and available dictionaries.

(2) The references listed serve to give assistance and direction to all members of the surgical team. The OR specialist enhances his value to other members of the surgical team and provides more effective care of the patient when he is able to interpret and apply the information available.

Continue with Exercises

EXERCISES, LESSON 2

INSTRUCTIONS. Answer the following exercises marking the lettered response that best answers the question or best completes the incomplete statement, or by writing the answer in the space provided.

After you have completed all of these exercises, turn to "Solutions to Exercises," at the end of the lesson and check your answers. For each exercise answered incorrectly, reread the material referenced with the solution.

1. For which one of the following reasons is a palliative surgical procedure done?

   a. Remove a diseased organ.

   b. Repair a body part.

   c. Cure a disease.

   d. Relieve pain.

2. A suffix used to denote an operation classified as an incision is which of the following?

   a. centesis.

   b. exeresis.

   c. scopy.

   d. desis.

3. A patient is scheduled to have a colpopexy performed. What is the operative procedure to be done?

   a. Suspension of the colon.

   b. Suturing of the scrotum.

   c. Incision into the bladder.

   d. Fixation of the vagina.

4. Which of the following actions would be helpful to a bereaved person?

    a. Making decisions for him.

    b. Helping him to feel like a valuable person.

    c. Giving him a sedative so that he does not have to deal with his feelings.

    d. Helping him to see that his grief serves no purpose.

5. After the doctor and hospital personnel have obviously done all that is possible to help Mr. Jones, he dies. His spouse is very angry with the doctor and threatens to sue. For what reason do you think Mrs. Jones is reacting in this manner?

    a. She is dealing well his her feelings toward her husband.

    b. She had neither positive nor negative feelings toward her husband.

    c. She and her husband had unresolved anger in their relationship.

    d. She feels in control of the situation.

6. What information is found on an instrument card in addition to the instruments needed for an operation?

    a. Sutures needed.

    b. Number of sterile gowns needed.

    c. Number of straight tools needed.

    d. Items such as sterile drains needed.

7. When the specialist desires a specific time off duty and no emergency exists, he should do which of the following?

   a. Ask for the time off after the schedule is prepared.

   b. Ask for the time off when the schedule is prepared, but before it is posted.

   c. Write the request before the schedule is prepared.

   d. Write the request when the schedule is prepared, but before it is posted.

FOR EXERCISES 8 AND 9. Use the following situation:

SITUATION: Your assignment for the day is to scrub for surgery.

8. Which of the following is the most appropriate source for learning detailed information concerning the performance of your assigned tasks as an OR specialist?

   a. Noncommisioned officer in charge.

   b. Operating room supervisor.

   c. Nursing Service Assignment Roster.

   d. Standing operation procedures.

   e. Operating Room Schedule.

9. Which of the following sources should be used to identify the operations to which you are assigned?

   a. Operating Room Schedule.

   b. Nursing Service Assignment Roster.

   c. Standing operation procedures.

   d. Non commisioned officer in charge.

   e. Operating room supervisor.

SPECIAL INSTRUCTIONS FOR EXERCISES 10 -- 25. These exercises are based on the facsimile of the OR Schedule found below.

OPERATING ROOM SCHEDULE						HOSPITAL Battle Army Community Hospital		DATE 30 MAY 19XX	
TIME & ROOM	PATIENT'S NAME STATUS AGE RELIGION	PATIENT'S REGISTER NUMBER & SSN + PREFIX	NURSING UNIT FROM	IN	OPERATION	SURGEONS	NURSING STAFF	ANESTHETIST	ANESTHETIC BLOOD (UNITS)
RMI 0730	JACKSON, CLARK A. MSG 42 yrs	613148 986-96-0449	16A	REC	NEPHROPLEXY, RT	DR. CROFT DR. FERMAN DR. DUDLEY	SFC GOOD (S) SSG JONES (S) SFC CLARK (C)	MAJ DODD	GENERAL ENDO T. 1000 cc
TF	BLAKELY, ROBERT COL Ret 60 yrs	602013 681-43-5103	16A	REC	VASECTOMY	DR. FERMAN DR. DUDLEY	SSG JONES (S) SFC CLARK (C)	MAJ DODD	GOE
RM II 0800	ABBOT, JAMES C D 8 yrs	671837 590-87-9620D	8B	REC	T & A	DR. HOWARD DR. WISE	SFC GREEN (S) SSG WINK (C)	CPT HOOD	OD ETHER
TF	WHITE, MARY C D 20 yrs	672363 900-32-2210D	8A	8A	SEPTECTOMY	DR. HOWARD DR. WISE DR. SMITH	SFC GREEN (S) SSG WINK (C)	SURGEON	LOCAL AND TOPICAL
RM IV 0800	FORD, DEAN F. MAJ 38 yrs	657131 740-90-9194	42B	REC	HERNIOPLASTY	DR. JENKINS DR. KLINE DR. MOODY	SSG WANE (S) SGT JOEL (C)	MAJ BLACK	SPINAL

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Operating room schedule for exercises 10-25.

SPECIAL INSTRUCTIONS FOR EXERCISES 10--20. Ten through 20 are based on the first operation listed.

10. "Rm 1" pertains to the:

    a. Patient's room number.

    b. Room to which the patient will be taken upon completion of surgery.

    c. Operating room in which surgery will be done.

    d. Induction room in which the patient will be anesthetized.

11. The specialist assigned to bring MSG Jackson to the surgical suite must obtain him from which place?

    a. Recovery room.

    b. Room one.

    c. Emergency ward.

    d. Nursing unit 16A.

12. What action should occur at 0730 hours?

    a. Someone should go to the ward and bring the patient to the OR.

    b. The scrub and the circulator should begin setting up the OR.

    c. The anesthetist should begin the induction of anesthesia.

    d. The surgeon should make the incision.

13. In accordance with the listing of the surgeons for MSG Jackson, the scrub must obtain whose suture card?

    a. Only Dr. Croft's.

    b. Only Dr. Ferman's.

    c. Only Dr. Dudley's

    d. All of the above surgeons.

14. With the knowledge that the patient will have a right nephropexy. Which of the following does the specialist have the information to determine?

    a. Sutures required.

    b. Operative area.

    c. Number of sterile gowns and gloves required.

    d. Time the induction of anesthesia will begin.

15. What operative procedure do the surgeons plan to perform upon MSG Jackson's right kidney?

    a. Incision.

    b. Excision.

    c. Fixation.

    d. Fusion.

16. The abbreviation "Endo" indicates that:

    a. The patient will be examined with an endotracheal tube.

    b. An endotracheal tube will be kept immediately available for emergency use.

    c. An endotracheal tube will be placed in the patient's trachea through his mouth or nose.

    d. An endotracheal tube will be placed in the patient's trachea through an incision in his throat.

17. Which of the following actions is appropriate for the circulator in assisting a member of anesthesiology service, MAJ Dodd?

    a. Set up the anesthetist's table.

    b. Set up the gas anesthesia apparatus.

    c. Place a revolving stool at the head of the operating table.

    d. Set up cautery equipment.

18. Who makes the decision as to the scrub's appropriate position at the operating table?

    a. Dr. Croft.

    b. Dr. Ferman.

    c. SFC Clark.

    d. SFC Good.

19. What does the "(S)" after SFC Good's name mean?

    a. He will supply the sutures needed for the case.

    b, He will pour the required solutions.

    c. He will stay in the room to help as needed.

    d. He will serve as the senior scrub.

20. What does "T.1000 ml" indicate?

    a. A tourniquet will be placed on the patient after he has lost 1000 ml of blood.

    b. A tube (endotracheal) will be placed into the patient while the last 1000 ml of anesthetic is being given.

    c. The patient will be given whole blood at 1000 hours.

    d. The patient has been typed and cross-matched for 1000 ml of whole blood.

SPECIAL INSTRUCTIONS FOR EXERCISE 21. Exercise 21 is based on the second operation listed.

21. Since "TF" is entered on the operating room schedule, when should the scrub and the circulator prepare the operating room?

    a. Twenty minutes after completion of the preceding case.

    b. Immediately upon completion of the preceding case.

    c. Twenty minutes before completion of the preceding case.

    d. When setting up for the first case.

SPECIAL INSTRUCTIONS FOR EXERCISE 22. Exercise 22 is based on the fifth operation listed.

22. "Herniorrhaphy" means that a hernia will be surgically:

    a. Drained.

    b. Removed.

    c. Repaired.

    d. Injected.

SPECIAL INSTRUCTIONS FOR EXERCISE 23. Exercise 23 is based on the fourth operation listed.

23. Which of the following is a duty of the circulator with regard to the patient's anesthetic?

    a. Notify the anesthesiology service that the patient is to have local anesthesia.

    b. See that a source of oxygen is available in the room.

    c. Remind the surgeon to obtain a source of oxygen and place it in the room.

    d. Set up the sterile table for the injection of the anesthetic.

SPECIAL INSTRUCTIONS FOR EXERCISES 24 AND 25. Exercises 24 and 25 are based on the last operation listed.

24. A hernioplasty is what kind of a surgical procedure?

    a. Introduction.

    b. Fixation.

    c. Repair.

    d. Crushing.

25. According to the anesthetic, the patient is scheduled to receive. Where should he be taken upon completion of surgery?

    a. Ward 42B.

    b. Recovery room.

    c. Ward 16A.

    d. Room IV.

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OPERATING ROOM SCHEDULE

HOSPITAL: Battle Army Community Hospital

DATE: 30 MAY 19XX

TIME & ROOM	PATIENT'S NAME STATUS AGE RELIGION	PATIENT'S REGISTER NUMBER & SSN + PREFIX	NURSING UNIT FROM	NURSING UNIT IN	OPERATION	SURGEONS	NURSING STAFF	ANESTHETIST	ANESTHETIC BLOOD (UNITS)
RMI 0730	JACKSON, CLARK A. MSG 42 yrs	613148 986-96-0449	16A	REC	NEPHROPLEXY, RT	DR. CROFT DR. FERMAN DR. DUDLEY	SFC GOOD (S) SSG JONES (S) SFC CLARK (C)	MAJ DODD	GENERAL ENDO T. 1000 cc
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RM II 0800	ABBOT, JAMES C D 8 yrs	671837 590-87-9620D	8B	REC	T & A	DR. HOWARD DR. WISE	SFC GREEN (S) SSG WINK (C)	CPT HOOD	OD ETHER
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Operating room schedule for exercises 10-25.

Check Your Answers on Next Page

SOLUTIONS TO EXERCISES, LESSON 2

1. d (para 2-b(1))
2. a (para 2-3a(3), d(1))
3. d (para 2-8e(1))
4. b (para 2-27b)
5. c (para 2-28b)
6. d (para 2-31c)
7. c (para 2-34e)
8. d (para 2-30)
9. a (para 2-33)
10. c (para 2-35b)
11. d (para 2-35f)
12. d (para 2-35c)
13. a (paras 2-35h, 2-35h(2))
14. b (paras 2-35g, 2-8e(1))
15. c (paras 2-8a(4), 2-8e(1))
16. c (para 2-35k)
17. c (para 2-35j)
18. d (para 2-35h(2), i)
19. d (para 2-35i)
20. d (para 2-35k(2))

21. b (para 2-35c)

22. c (para 2-10b)

23. b (para 2-35j)

24. c (paras 2-8a(1), b(4))

25. b (para 2-35f)

End of Lesson 2

LESSON ASSIGNMENT

LESSON 3	Safety in the Operating Room
LESSON ASSIGNMENT	Paragraphs 3-1 through 3-18.
LESSON OBJECTIVES	After completing this lesson, you should be able to:

3-1. Select the correct answers to questions concerned with procedures and equipment necessary to guard against explosions, fires, and other hazards in the OR.

3-2. Identify your role in the care and handling of unconscious or sedated patients.

3-3. Identify the procedures used for transporting patients into and out of the OR.

SUGGESTION After completing the assignment, complete the exercises of this lesson. These exercises will help you to achieve the lesson objectives.

LESSON 3

SAFETY IN THE OPERATING ROOM

Section I. INTRODUCTION

3-1 GENERAL

a. **Safety.** Safety is freedom from danger, injury, or hazard. Safety in the surgical suite necessitates the maintenance of safeguards for both the patient and the OR team. The safety of the patient must always be considered when preparing an OR as well as giving patient care. Thus, safety measures should involve a hazard-free environment, safe work methods, and safe equipment. Accident prevention is a responsibility shared by all members of the OR team.

b. **Factors in Accidents.** The main reasons for accidents in the surgical suite are--negligence by the personnel, careless work habits, improper use of equipment, and use of faulty equipment. Most of these hazards can be avoided if all personnel in the surgical suite observe safety rules, practice safety measures, and recognize and eliminate (or report) hazards. Knowledge of safety measures required for the protection of patients and personnel is therefore of primary importance to the OR specialist.

3-2. ELIMINATION OF HAZARDS

Safety in the OR can be achieved by being constantly alert and vigilant to the inherent dangers and eliminating hazards as soon as they develop. Patients have lost their lives through careless and unsafe practices that have resulted in accidents, deadly explosions, and fires. Operating room specialists have many opportunities to become aware of existing hazards; they, therefore, play a major role in eliminating such hazards.

Section II. EXPLOSION AND FIRE HAZARDS

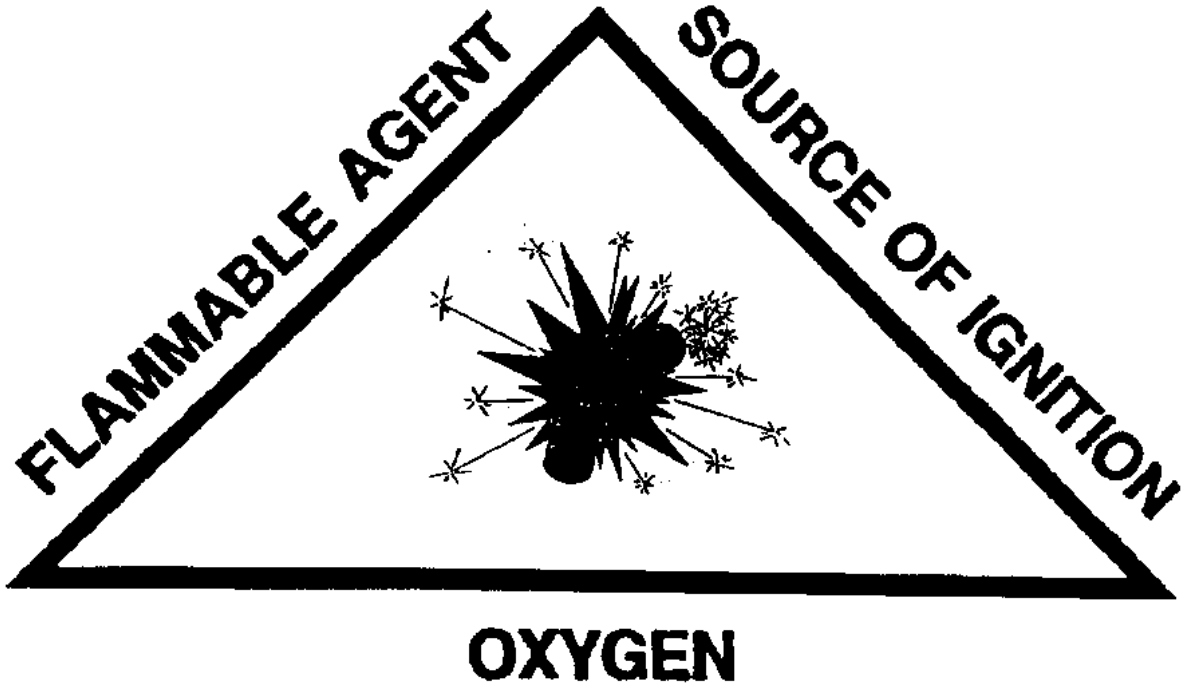
3-3. DEFINITIONS

a. **Hazardous Locations.** Hazardous locations are those rooms in which either combustible anesthetic agents or disinfecting agents are stored and the areas in anesthetizing locations extending upward to five feet from the floor.

b. **Anesthetizing Location.** These are areas in the hospital where combustible anesthetic agents are administered to patients. Operating rooms, delivery rooms, anesthesia rooms, and rooms used for preoperative preparation of patients are included in these locations. Also included are corridors, utility rooms, and other areas used for the induction of anesthesia.

3-4. CONDITIONS PRODUCING EXPLOSIONS

Three conditions must be present to produce an explosion--first, a flammable agent (gas, vapor, or liquid) must be present; then, there must be a source of ignition as well as oxygen or a substance providing oxygen. (See figure below of explosion representation). The elimination of any one of these conditions is an important factor in the prevention of explosions.



NOTE: The above figure is representative of an explosion.

3-5. ELIMINATION OF COMBUSTIBLE (FLAMMABLE) AGENTS

a. **Anesthetic Agents.** Standard anesthetic agents that are flammable are ethyl ether, vinyl ether (divinyl) oxide; trade name--Vinethene), and ethyl chloride. Flammable agents that are not standard items are cyclopropane and ethylene. As a means of eliminating the danger associated with the use of these agents, the excess concentration of gas, vapor, or liquid fumes may be reduced. Ventilating or air-conditioning systems which provide complete exchanges of air will aid in reducing the concentration of gases and prevent the formation of pockets of gas in the room.

(1) Ether is easily spilled because it is liquid and its fumes may then collect near the floor as well as near the anesthesia area. Care must be exercised that this agent is not spilled on the drapes or blankets used for covering the patient because of the serious fire hazard.

(2) Other methods of elimination of gas concentration are the use of closed techniques in the administration of anesthetics and the use of nonflammable anesthetic agents. Both of these methods are the responsibility of the anesthetist.

b. **Disinfecting Agents**. Tinctures of disinfectants such as tincture of iodine and tincture of merthiolate are combustible. Improper use of these disinfectants (for example, spilling, using an excessive amount in skin preparation, or tipping containers) is a source of danger. Aqueous germicides are recommended for use rather than tincture disinfectants.

3-6. ELIMINATION OF SOURCES OF IGNITION

a. **Sources of Ignition.** The main sources of ignition include electrostatic spark (which is the most common), fixed and portable electrical equipment, and open flames or heat above the temperature at which gases will ignite.

b. **Electrostatic Spark.** Electrostatic spark is caused by friction between unlike and nonconductive objects or materials. Everyone is familiar with sparks which are seen and felt when an individual combs his hair, shuffles his feet across a rug, or slides in or out of his car on a cold dry day. For purposes of this discussion, the precautions that must be observed to eliminate these electrostatic sparks are of two categories. The first category (c, below) emphasizes those precautions, which must be observed by the OR personnel; the second category (d, below) emphasizes the precautions to be observed in the construction of the OR, its equipment, and use. <u>All are important.</u>

c. **Precautions To Be Observed By Personnel.**

(1) The hair must be covered completely. Operating room personnel must wear a cap or hood; the patient's hair should be covered with a cap or a cotton hand towel that is pinned about the head.

(2) Materials that accumulate static (wool, nylon, rayon, sharkskin, silk, or plastics) must not be worn. However, hose and underclothing of these fabrics whose entire surfaces are in contact with the skin are permitted. Slips or petticoats must be made of cotton because of their free-hanging skirts. Outer garments must be made of cotton.

(3) Conductive shoes should be worn. If this type of shoe is not available, conductive stick-ons, slip-ons, or booties may be worn with ordinary shoes. Shoes must not have ferrous (iron) nails because of the danger of percussion sparks. Conductive shoes, etc., are not conductive if the shoes are covered with an accumulation of wax, dust, or dirt. Soles should be cleaned at regular intervals, usually daily, with a detergent solution. Each day, the shoes should be tested for conductivity on the conduct meter.

(4) No woolen blankets are permitted in the OR. Cotton blankets only are to be used and they should not contain synthetic fibers (dacron, nylon, and so forth) or have bindings of these materials. Blankets should be opened slowly and carefully, never flipped. Blankets should not be warmed because heating removes moisture, thus increasing the possibility of electrostatic spark.

(5) Personnel should avoid any unnecessary motion in the area near the patient's head and the anesthesia equipment. They should stay away from the anesthetist and anesthetizing equipment as much as possible.

(6) When draping the patient and during the operative procedure, care must be exercised that the drapes do not come in contact with the breathing bag of the anesthesia machine; such contact may result in an explosion.

(7) Any contact with the anesthetist or with the patient is to be made by first touching the anesthetist's stool, the operating table, or the patient's skin at least two feet from the mask on the patient's face. Any electrostatic charge within the individual is then dissipated before he is close to the anesthesia equipment or mask.

(8) Extreme caution should be used when moving anesthesia equipment. Equipment is moved only under the direction of the anesthetist.

(9) The humidity of the facemask, tubes, or breathing bag may be raised by flushing them with water. This is a responsibility of the anesthetist and may be done as an added precaution against accumulation of static charge within the machine itself.

d. **Precautions Observed in Construction of the Suite and Equipment.**

(1) Conductive flooring, usually ceramic or vinyl plastic tile, is installed. Such flooring disperses static charges but does not subject personnel to electrical shock. After being cleaned with detergent solution, this type of flooring must be thoroughly rinsed to prevent the accumulation of a soap film. It is never waxed except with a wax prepared especially for conductive flooring. Ordinary waxes or soap film will lower its conductivity. The floors should be checked for conductivity at least once a month.

(2) Furniture is made of metal with the leg tips or casters made of either metal or conductive rubber to provide a conductive path to the floor. Casters must be kept clean because they will lose their conductivity if allowed to accumulate dirt, wax, lint, suture material, or other debris. Clean casters usually function properly, but if the casters must be lubricated, a small amount of dry graphite or graphite oil should be used. Furniture is not to be painted or lacquered.

(3) Carbon-permeated rubber mattresses, pillows, and sheeting should be used. The leg strap for the operating table should be made of conductive material. All of the rubber parts on the anesthesia equipment should be made of conductive rubber including the breathing tubes, the breathing bag, and the face masks.

(4) An instrument (ohmmeter) is used to measure the electric resistance of personnel and equipment.

(5) All plugs, sockets, and switches must be explosion-proofed for use in anesthetizing locations.

(6) Only electrical equipment that has been designed for use in hazardous locations may be used. This includes extension cords used with portable equipment. All electrical equipment for use in an individual OR is checked daily by the OR specialists assigned to that room. Any faulty equipment is to be reported to the NCOIC immediately and is not to be used until it has been repaired. The equipment is checked routinely once a month by the maintenance department.

(7) The electric cautery is to be used with extreme care. Flammable agents such as tincture disinfectants should not be used in the final skin preparation. The switch and control of the cautery must be at least three feet from the anesthesia machine and mask. The patient must be draped in such a manner that a barrier is between the area where anesthetic mixtures are being given and the area where the cautery is being used. Only moist sponges, usually saline, are permitted in the operative field when the cautery is in use.

(8) Extreme care must be exercised when high voltage equipment (such as the X-ray, fluoroscope, electric bone saw, or dermatome) is being used.

(9) The use of photoflash and photoflood bulbs should be prohibited.

(10) Any departure from the safety rules in the use of equipment such as cautery, X-ray, fluoroscope, and so forth, must be approved by the anesthetist.

(11) Anesthesia machines or oxygen cylinders are never to be completely covered. The cover will confine any gas or oxygen, which may have leaked from the cylinder when the cover is removed; an electrostatic spark may be created which will ignite the gas that has been confined under the cover.

(12) Anesthesia equipment must be kept in good repair and must be leak proof. The care of this equipment is the responsibility of the anesthesia department. The equipment is usually checked at least once a month by the medical maintenance department.

(13) Anesthesia machines, compressed gas cylinders, and containers of flammable liquid are to be kept away from radiators, steam pipes, or other sources of heat. These should not be stored in the same room or area with oxygen or nitrous oxide cylinders.

(14) Oil or grease is never to be used on any part of the anesthesia machine or oxygen valve.

(15) The humidity of the OR should be kept at 55 to 60 percent to lessen the accumulation of static charges.

e. **Elimination or Control of Sources of Heat.** Sources of heat should be rigidly controlled or entirely eliminated, if possible to reduce to a minimum another factor which may cause an explosion.

(1) No smoking should be permitted in hazardous area.

(2) Open flames such as lighted matches or alcohol lamps may be used in some operative procedures but only after their use has been cleared by the anesthetist.

(3) Electric hot plates should never be used in the same room or area where flammable agents are stored or used.

3-7. ELIMINATION OF HIGH OXYGEN CONCENTRATION

a. **Discussion.** High oxygen concentration, whether caused by extended use or by improper handling of oxygen cylinders, must be reduced to a minimum.

b. **Ventilating or Air-Conditioning Systems**. Systems should be provided which permit complete exchanges of air.

c. **Oxygen Cylinders**. Oxygen cylinders must be operated properly. The precautions that must be observed when handling oxygen cylinders and regulators to prevent high concentrations and explosions or fire are as follows:

(1) Never permit oil, grease, or readily combustible materials to come in contact with oxygen cylinders, valves, regulators, gauges, or fittings.

(2) Never lubricate regulators, fittings, or gauges with oil or any other combustible substance.

(3) Never handle oxygen cylinders or apparatus with oily hands, greasy gloves, or dirty rags.

(4) Always clear the particles of dust and dirt from the opening to each cylinder by just barely opening and closing the valve before applying any fitting to the cylinder. (This is called "cracking" the valve. The specialist should point the valve opening away from his face while cracking the valve.)

(5) Never permit oxygen to enter the regulator suddenly; open the valve slowly. The regulator reduces the pressure of oxygen to a low pressure that is safe to use; it ensures a steady, even flow of oxygen; and it provides a means for adjusting the rate of flow.

(6) Never drape an oxygen cylinder with any materials such as hospital gowns, masks, caps, sheet, plastic material.

(7) Never use oxygen fittings, valves, regulators, or gauges for any other service except oxygen.

(8) Never mix gases of any type in a oxygen cylinder or in other type cylinder.

(9) Never use oxygen from a cylinder except through a pressure-reducing regulator.

(10) Never attempt to use regulators that are in need of repair and do not attempt to use cylinders having valves that do not operate properly. They can be removed. The common types of accidents due to hazards other than fire and explosion and the measures used to prevent them are discussed below.

(11) Never attempt to repair defective oxygen equipment, unless properly qualified by knowledge and experience.

3-8. FIRE EXTINGUISHERS

Table 3-1 lists the fire extinguishers used for different types of fire that may occur in the OR. The OR specialist should know the location of these extinguishers and be thoroughly familiar with their operation.

TYPE OF FIRE	TYPE OF EXTINGUISHER	HOW USED
CLASS "A" Wood, paper, coal, etc.	Water pump tank	Pump and direct nozzel.
	Soda and acid	Turn upside down and direct nozzle.
	Foam	Turn upside down and direct nozzle.
CLASS "B" Oil, gasoline, solvent, etc.	Foam	Turn upside down and direct nozzle.
	Carbon Dioxide	Open valve and direct horn.
CLASS "C" Electrical origin	Carbon Dioxide	Open valve and direct horn.

Table 3-1. Types of fire extinguishers and their uses.

Section III. HAZARDS OTHER THAN FIRES AND EXPLOSIONS

3-9. INTRODUCTION

In the OR, there are many hazards in addition to those of fires and explosions, which must be eliminated to ensure a safe area for patients and personnel. Constant alertness and care are the only means by which they can be removed. The common types of accidents because of hazards other than fire and explosion and the measures used to prevent them are discussed below.

3-10. UNCONSCIOUS OR SEDATED PATIENTS

Numerous hazards pose dangers to unconscious or sedated patients. The specialist must therefore be especially cautious when caring for such patients.

a. **Attendance of the Patient.** Never leave an unconscious or sedated patient alone on the operating table, stretcher, or in a wheelchair. He may fall or roll from the table and injure himself. A sedated patient may be confused or disoriented in addition to being drowsy and because of this, he may attempt to get off the table or stretcher and thereby injure himself. Ensure that side rails are raised and locked into position.

b. **Transportation of the Patient.** Exercise care when transporting the patient to and from the OR so that he is not injured going through doors and hallways. Restrain the patient lightly to prevent him from rolling from the stretcher during transportation. Ensure that side rails are raised and locked into position. Cover him adequately to avoid chilling.

c. **Application of Restraints.** Apply restraints so there is no pressure on the nerve, no impairment or respiration, and no obstruction of circulation.

d. **Position of the Patient.** Keep the body of the patient in proper alignment when placing him in position for surgery. There should not be unnecessary strain on the muscles. All braces and attachments used in positioning the patient must be padded. When the patient's position is to be changed, he should be moved slowly and gently to prevent circulatory depression.

e. **Removal of Prosthesis.** All removable prosthesis will be left on the ward, properly identified and stored. A final check will be conducted in the OR to ensure that all prosthesis (false teeth, false eyes, and so forth) has been removed.

NOTE: The surgeon may wish to have a prosthetic device left in place for the performance of certain reconstructive surgery. In this event, he will write an order on the patient's chart for the benefit of the nursing unit personnel. Also, the OR Schedule should include a notation to leave the prosthetic device in place.

3-11. TRANSPORTING THE PATIENT

a. **Discussion.** Within any treatment facility, the methods and procedures used for taking a patient into and out of an OR must be implemented in such a way that the patient is not harmed in the process. The methods and procedures in use vary, depending upon the type of medical installation. For example, at an aid station caring for the combat wounded, transporting the patient prepared for surgery may involve little more than lifting the litter onto litter supports and reversing the procedure after surgery.

In a large hospital, a more elaborate procedure is necessary. Regardless of the type of treatment facility, however, the basic purpose of transporting the patient is the same--to move the patient safely in and out of the OR. To this end, the OR specialist transporting patients should observe many precautions.

b. **Responsibility of the Operating Room Specialist.** In a large hospital, the circulator is often the person who transports the patient to the surgical suite. However, another specialist from the surgical staff may be assigned to transport the patient when the surgery load is heavy, when the distance from nursing unit to OR is long, or when local policy so prescribes. The anesthetist and surgeon always accompany the patient to his post-surgical destination. The specialist is responsible for the patient's safety and well being whenever he is transporting the patient. Therefore, the specialist must know the appropriate procedure for obtaining and transporting the patient. The specialist must know how to recognize and deal with symptoms of distress in the patient and know the location of emergency supplies and equipment along the route. The specialist must never leave the patient unattended on transporting equipment. One person must be with such a patient at all times. In addition, the specialist must account for the patient.

c. **Preliminary Preparation.**

(1) Preparing the litter. The specialist's first step in transporting the patient is to "dress" the litter (see figure 3-1). This is to be done in such a way as to ensure the safety and comfort of the patient while in transit. The specialist does this procedure as follows:

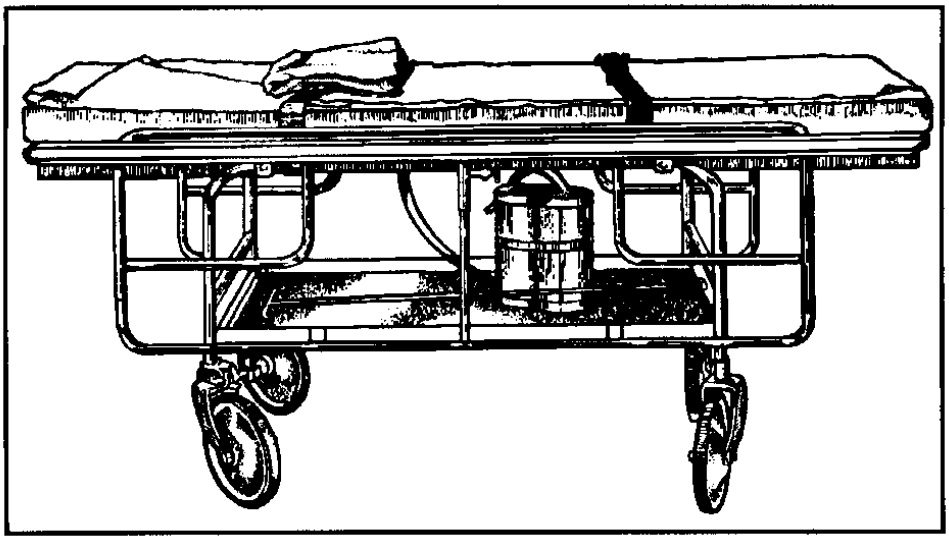


Figure 3-1. Dressed OR litter with safety straps attached.

(a) Place a sheet, folded in half, lengthwise, on the mattress of the litter and tuck it under the mattress all around.

(b) Open fully a second sheet, centered lengthwise, and place it in the litter with one edge at the head of the litter. Now fanfold the sheet from both sides and fold the remaining material at the foot of the mattress.

(c) Place a folded sheet on the litter for use as the cover. If the patient is likely to need additional covering during transport, provide a sufficient number of blankets, made of cotton only. Also place a safety strap, or straps as local policy may require, around the litter (see figure 3-1). Check the OR Schedule and write the patient's name on a piece of paper for reference when on the nursing unit. The OR Supervisor or the OR NCOIC usually directs the specialist to transport the patient.

(2) Accounting for the patient.

(a) Just before leaving the surgical suite, the specialist should draw a circle around the patient's nursing unit number on the OR schedule. This will indicate to other team members that the process for delivering the patient to the OR has been started.

(b) When he brings the patient into the OR, the specialist makes a diagonal mark across the circle.

(c) When the patient is taken from OR, the specialist makes another diagonal mark across the circle so that the final appearance of the nursing unit number is like this--42A. Thus, the patient is accounted for at all times. The particular method may vary, but each OR uses some system to save time and avoid confusion.

d. **Identifying the Patient.**

(1) Report to the charge nurse. Immediately upon arriving on the nursing unit, the specialist who is to transport the patient reports to the charge nurse, announces the name of the patient, and is told the location of the patient. The Specialist is given the patient's chart, which should contain all laboratory reports, the signed operative permit, and the patient's X-rays. He places these under the foot of the litter mattress.

(2) Specialist's attitude and manner. The specialist must do his best to inspire confidence in the patient. All patients are usually fearful at this time of what may happen to them. Therefore, the specialist must be cordial, considerate, tactful, and accepting of the patient's behavior. A pleasant greeting and explanation of what he is going to do will be appreciated by the patient. Avoid flippancy and apathy.

(3) Confirm identification. Having greeted the patient with a pleasant "good morning" and checked the patient's bed card against the name he has written on the paper, the specialist asks the conscious patient--"What is your name?" (A sedated patient will often agree with any question, which requires only a yes or no answer.) The specialist also checks the hospital identification band (see figure 3-2) worn on the patient's wrist. Local policy may require the charge nurse or someone else on the ward to confirm identity of the patient.

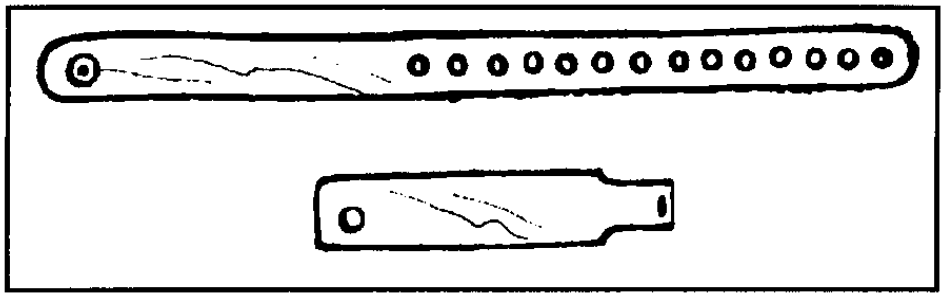


Figure 3-2. Identification band.

(4) Ensure that the patient's preparation is complete. The patient scheduled for surgery is to be attired as prescribed by local policy. The specialist is to put an OR cap on the patient's head in such a way as to cover his hair. Jewelry and prosthetic devices are to be removed by nursing unit personnel and put in a safe place to prevent loss and to protect the patient from possible hazards while he is unconscious. Exceptions may include a patient's wedding ring and religious medal. The ring is to be taped securely to the patient's finger. A religious medal, if the patient desires to wear it, is to be taped directly to the skin. The patient is never to wear such a medal, or any other item around his neck during surgery. An additional exception is a prosthetic device that the surgeon wishes to have left in place. The OR specialist should make a quick but thorough check to see that the patient is in readiness for transportation to the OR.

NOTE: Remember that the patient's wedding ring and/or religious medal may be taped to his skin ONLY if these objects will NOT interfere with the surgical area. (See figure 3-3.) If this is the case, local policy will dictate the correct procedure to follow.

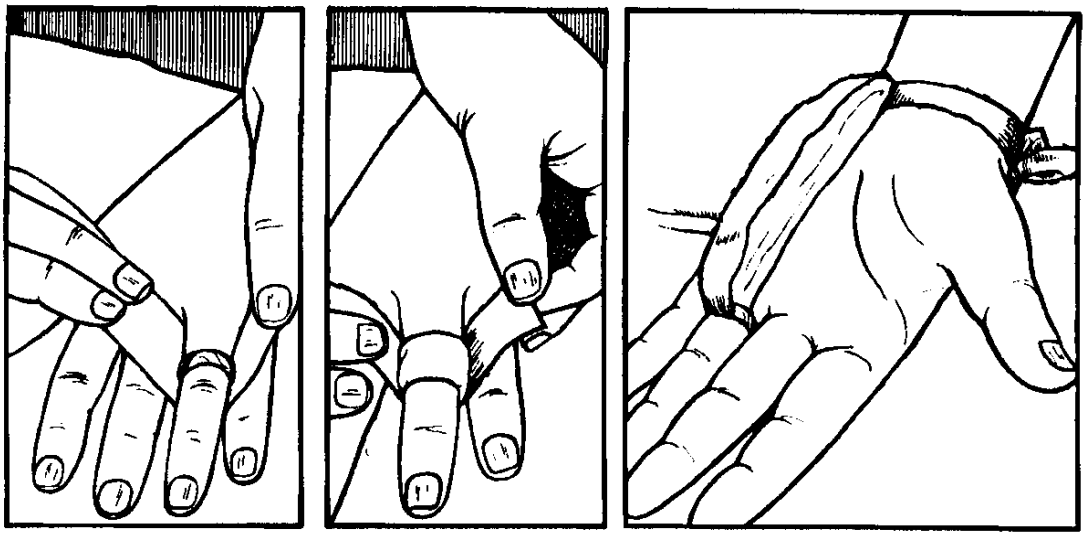


Figure 3-3. Securing wedding ring.

e. **Transferring the Patient to the Litter.**

(1) If the patient can help himself, the specialist should proceed as follows:

(a) Release the safety straps and cover the patient with the cover sheet from the litter.

(b) Pull the bedclothes to the foot of the bed, leaving the cover sheet over the patient.

(c) Unfold the fan folded litter sheet and move the litter parallel to and against the bed. Check to see that the wheels on the bed are locked.

(d) Stand on the free side of the litter, reach across it and keeping it steady, place your arms under the patient's shoulders and thighs, and assist him in moving onto the litter. The patient should lie on his back with arms at his side.

(e) The previously fan folded sheet is brought up from the sides and foot to cover the patient completely. Cover the patient additionally if necessary and tuck the covers under the litter mattress. If necessary, use cotton blankets.

(f) Fasten the safety straps snugly over the patient's thighs and the chest, and under and around the litter. Thus, both the patient and the specialist are assured that the patient will not fall off. Do not fasten the straps too tightly, as the patient's circulation may be impaired. The straps should be secured in such a way as to enable the specialist to run his hand, palm down, between the strap and the patient (see figure 3-4).

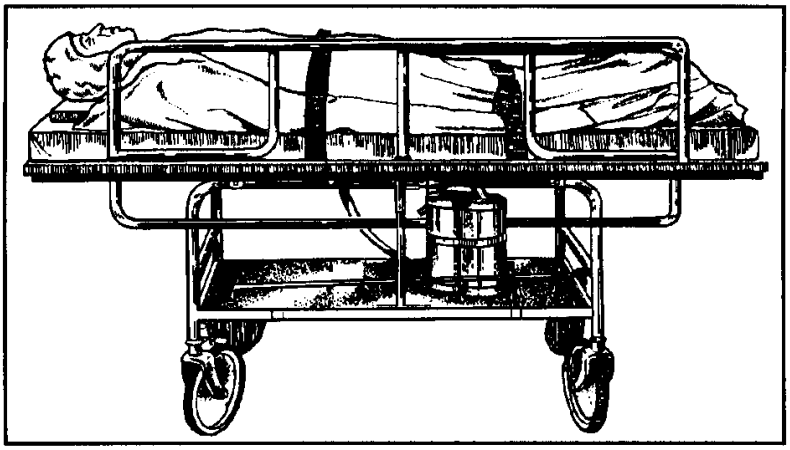


Figure 3-4. Patient ready to be transported.
(Note position of side rail and safety straps.)

(g) Raise and lock litter side rails.

(2) If the patient cannot help himself, he must be lifted onto the litter. A team of at least three people is required to transfer an adult patient from the bed to the litter. They should proceed as follows:

(a) Release the safety straps, cover the patient with the cover sheet, and remove the bed clothing as in (1)(a) and (b) above.

(b) Place the litter at a right angle to the bed, with the head of the litter at the foot of the bed. Unfold the fan folded-litter sheet.

(c) Lock the litter wheels. Make sure that the bed wheels are also locked.

(d) Team member number one. Slide one hand under the patient's head and to his opposite shoulder so that the patient's head rests in the bend of the elbow. Place the other hand under the patient's shoulders and his opposite arms (see figure 3-5A).

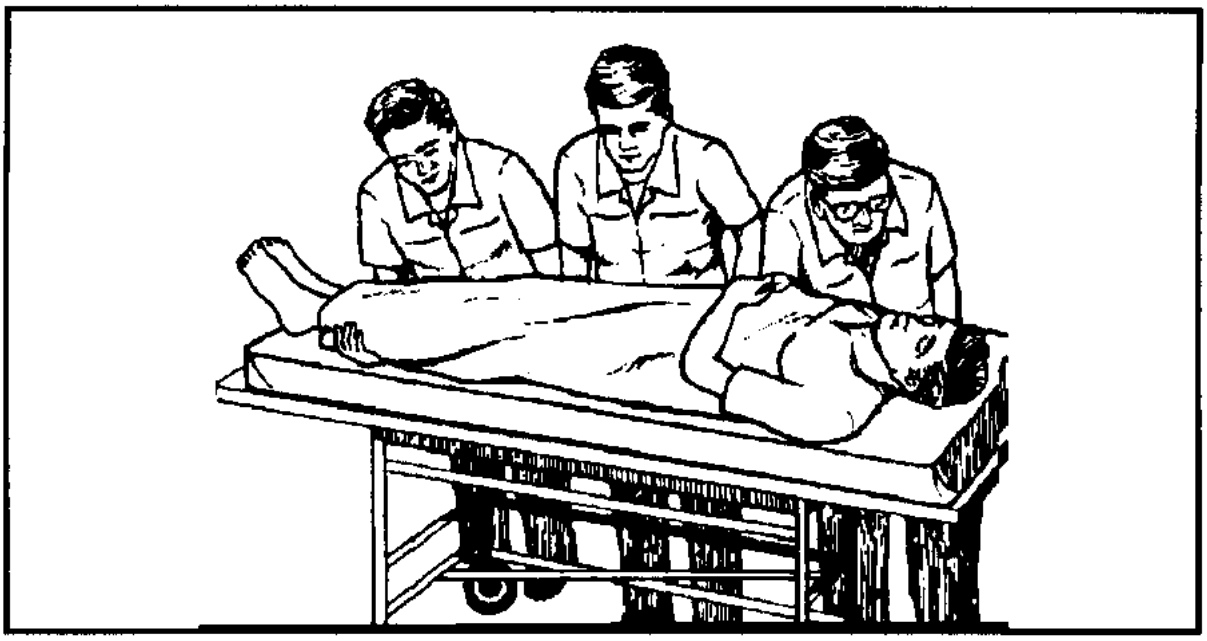


Figure 3-5A. Team member number one positioning patient for three-man carry, bed to wheeled litter.

(e) Team member No. 2: Place both hands, palm up, under the patient's hips. (See figure 3-5B).

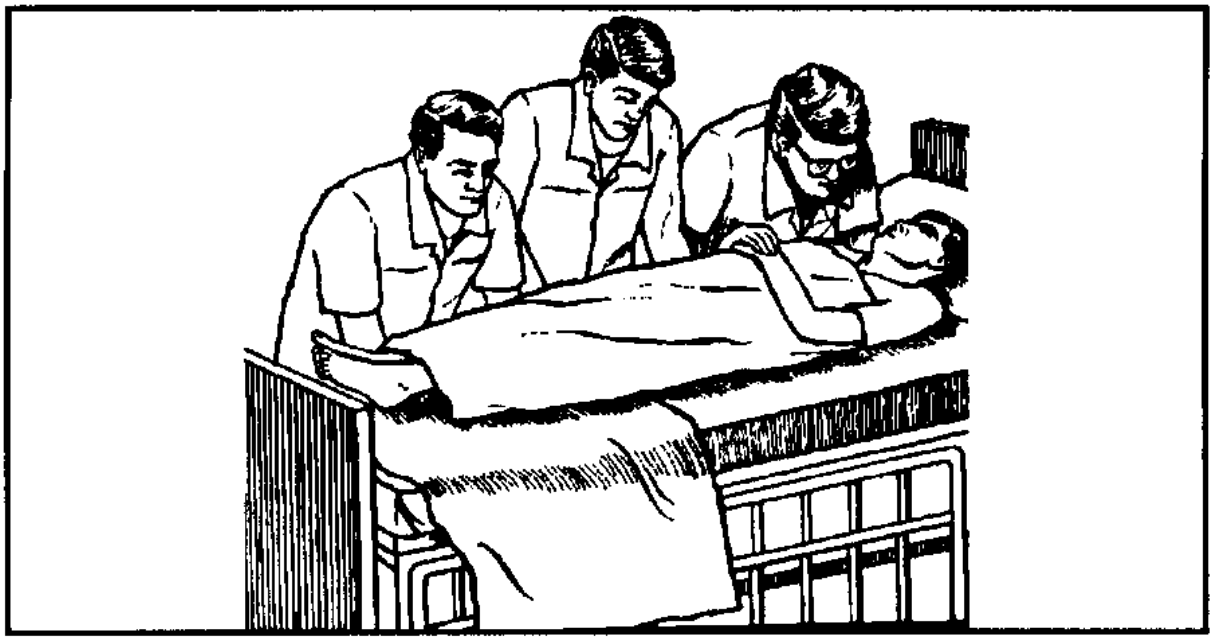


Figure 3-5B. Team member No. 2 positioning patient for three-man carry, bed to wheeled litter (continued).

(f) Team member No. 3: Place one hand under the patient's thighs and the other under the calves of his legs.

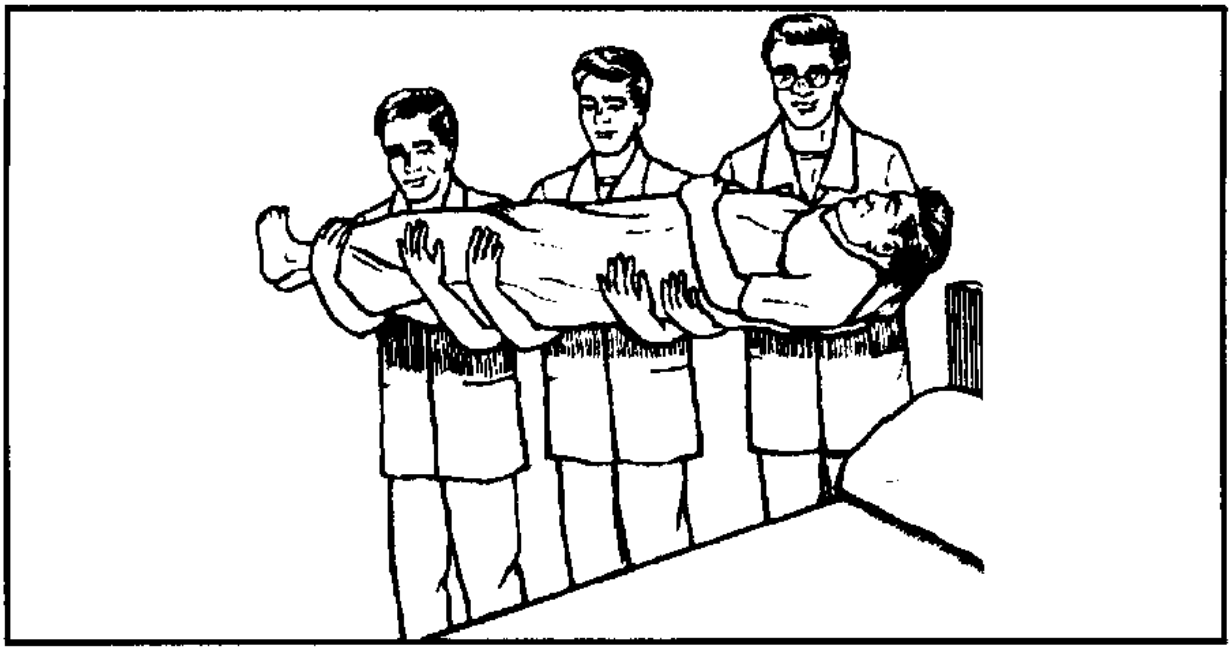


Figure 3-5C. Team members shown doing three-man carry of patient, bed to wheeled litter (continued).
(**NOTE**: Cover sheet omitted for visual clarification.)

(g) On signal, draw the patient to the edge of the bed, tilt him slightly toward the team members' chests, and lift him from the bed (see figure 3-5B).

(h) On signal, turn so that the patient's head is toward the head end of the litter, advance to the litter, and carefully place the patient on the litter (see figure 3-5C).

(i) Cover the patient additionally if necessary and tuck the covers in as described above.

(j) Fasten the safety straps as described in (1)(f) above (see figure 3-4).

(k) Raise and lock side rails.

(3) Whenever the patient is connected to some kind of apparatus, the specialist should carry out additional safety measures as follows:

(a) If the patient has an IV running, the bottle should be suspended on a litter standard. The litter standard has a plate that, when slipped under the litter mattress will hold the standard upright and support the IV supply bottle. This should be placed near the middle of the litter (never at the head). Thus, if it should fall, it is less likely to injure the patient. The team members lifting a patient with an infusion running should exercise care so as not to disturb the setup. Protection is afforded by splinting the patient's arm. A fourth person may be required to hold the infusion bottle while the patient is being transferred to the litter. If a fourth person is not available, the IV tubing must be clamped off and the bottle hung over the finger or the arm of one of the three people lifting the patient. The bottle is then hung on the standard and the clamp opened. If no litter standard is available, another person must accompany the specialist and the patient to the OR to hold the IV bottle at the same height above the patient as it was in the patient's unit.

(b) The management of drainage equipment will vary with its type and function. If the patient has a urethral catheter connected to a tube leading into a drainage bag, the specialist should clamp the tube. Similar technique is to be used with suction tubing. Drainage will be restarted in the OR if the surgeon desires.

(c) If there is chest drainage, the tubing should be double-clamped on the nursing unit. An assistant should carry the drainage bottles at a level below the height of the patient's chest.

f. **Wheeling the Patient.** One specialist can safely wheel the patient on a litter if the route to the OR is smooth and does not include steeply inclined ramps and if the patient has no special apparatus attached which requires the attention of an additional person. The specialist is to push the litter ahead of him, guiding it from the

head end. He is to move at a safe pace, being careful not to bump anything or anyone, not to turn corners sharply or otherwise disturb or frighten the patient. When entering the elevator the patient is wheeled in headfirst. The specialist must not smoke while wheeling the patient.

g. **Arrival at the Surgical Suite.** Upon arrival at the surgical suite, the specialist should report to the anesthesia department and to the OR supervisor or the NCOIC; in addition, as stated above, he should draw a diagonal mark across the patient's nursing unit number on the OR schedule. The specialist remains with the patient (unless he is properly relieved) until the patient is to be transferred onto the operating table. The specialist is then to assist in transferring the patient to the table.

h. **Care of the Patient Awaiting Surgery.** The patient may be brought to the surgical suite before the scheduled time for his operation, necessitating a wait somewhere outside the OR in which his surgery will be performed. It is important that the patient remains relaxed and comfortable during his wait, since a favorable environment at this time contributes much to a smoothly conducted, successful operation. Therefore, the OR specialist should place the patient's litter away from glaring overhead lights, into a dimly lit area. The specialist, as well as all of the personnel in the surgical suite, should cooperate in maintaining a quiet atmosphere, because the patient is especially sensitive to noise at this time. Loud talking, laughing, discussion of operative procedures within his hearing, or other inappropriate behavior can frighten the patient and destroy his confidence in the surgical team. In addition to making the patient's environment as calm and serene as possible, the specialist may make the patient more comfortable by placing a pillow under his head and by allowing him to turn on his side; however, first the specialist must ensure that these measures are not contraindicated (made inadvisable).

i. **Transferring the Patient to the Operating Table.** The patient may be transferred to the table either inside or outside the OR. In either case, the sheet coverings on the patient are loosened while the patient is outside the OR in order to hold to a minimum the fanning of the covers, with their microbial population, in the OR. The patient is transferred with the cover sheet over him.

(1) Outside the operating room. When the patient is transferred outside the OR, the operating table is brought out to the litter. After the patient is transferred, the table is wheeled back into the OR and the wheels of the table are locked.

(2) Inside the operating room. When the patient is placed on the table inside the OR, the litter is wheeled into the OR and placed alongside the table. After the patient is transferred, the litter is wheeled from the room.

j. **Procedure During and After Surgery.**

(1) Preparation of the litter. As soon as a patient has been transferred from the litter to the operating table and while the patient is still in the OR, the litter is to be stripped, cleaned as necessary, and "dressed" to await further use. These procedures may be carried out by the circulating specialist or by another person assigned by the OR Supervisor or NCOIC. The person who dresses the litter should also see that hand towels and an emesis basin are at hand to accompany the patient to his post-operative destination. Some postoperative patients become nauseated and vomit during transit. The emesis basin and towels are used to keep the patient clean and comfortable.

(2) Delivery of the patient. Upon the completion of surgery, the patient is lifted onto the litter and positioned. The safety straps are fastened, and he is transported to either the recovery room or the nursing unit. Both his position and his destination depend upon the type of anesthetic and the kind of surgery the patient has undergone.

(a) The patient who has been given a general anesthetic should be placed in a lateral recumbent (side-lying) position unless this position is contraindicated by the surgery performed. In which case the patient should be placed either supine (on his back) or prone (on his abdomen), with his head turned to one side. Turning the head to one side facilitates the normal drainage of secretions and helps prevent the aspiration of secretions and vomitus. The endotracheal tube, if one has been inserted, should be left in place and kept free from obstruction until the patient's gag reflex returns. Usually, the anesthesiologist or anesthetist accompanies the patient to the recovery room, and there is assisted by either the circulator or the specialist who assisted with anesthesia during surgery. The patient who has had a spinal anesthetic should be transported to the recovery room in either a dorsal recumbent (supine) position or prone position.

(b) When brought into the recovery room, the patient may be transferred to recovery room equipment or remain on the wheeled litter for care by recovery personnel. (In either case, the specialist should put side rails in place to ensure that the patient will not fall off the bed.) A patient expected to remain in the recovery room for only a short time may afterwards be wheeled to the nursing unit on the same litter on which he was brought to the recovery room. If a lengthy stay in the recovery room is anticipated, the patient is often placed in a recovery room bed immediately after surgery. An arrangement that provides for a minimum number of transfers of the postoperative patient protects the patient who has had spinal or general anesthesia from sudden and dangerous drops in blood pressure.

(c) The trip for the delivery of the patient to the nursing unit may originate in the OR or the recovery room. A patient who has given a local anesthetic or regional block is transported directly from the OR to the nursing unit by an OR specialist. If the distance from the OR to the nursing unit is short, one OR specialist may transport the patient. However, two persons may be assigned when the trip is time-consuming because of either the distance or other factors.

(d) While transporting a patient, the specialist must be continually observant for symptoms of respiratory difficulty, shock, or hemorrhage, and should be ready to employ emergency techniques that are within his capability. He must know the location of emergency equipment such as suction machines and oxygen therapy equipment along the route. He must also be able to summon professional aid and assist with emergency procedures instituted by the MC Officer or the AN Officer who responds to his call for help. Upon arriving on the nursing unit, the specialist is to report to the nursing unit office, return the patient's chart, and request help as needed for transferring the patient onto his bed. The specialist and any designated helpers then wheel the patient to his bed and place him upon it.

k. **Other Means of Transporting the Surgical Patient.** All pieces of equipment brought from the nursing unit must be damp-dusted with alcohol or as directed before being brought into the OR. This includes the beds, turning frames, and equipment for transporting infants discussed below.

(1) Adjustable (Gatch) bed. The patient may be wheeled to the OR upon his bed. A patient who is seriously ill or one who is to have cardiac or chest surgery is in this way spared the procedure of being transferred to a litter, a procedure that may endanger the life of such a patient. The bed is adjusted to place the patient in the position that is most healthful and comfortable to him. At least two specialists are required to wheel the patient in bed to his destination. The specialists must secure side rails onto the bed and be very careful not to traumatize the patient, either physically or mentally, during transit.

(2) Fracture bed. The surgeon may order that a patient scheduled for orthopedic surgery be transported in his fracture bed. This means of transportation is especially desirable when traction has been applied preoperatively since removing it could put the body out of alignment. At least two specialists are required for transporting a patient in a fracture bed. The specialists must use every precaution during transit to avoid disturbing the traction or otherwise injuring the patient.

(3) Turning frame or reversible bed. Surgeons often order that patients upon Stryker frames or Foster beds be transported on them. The specialist must apply several safety straps before transporting the patient since patients on turning frames are often helpless (because of injuries to the spinal cord or the brain, certain kinds of orthopedic conditions, severe burns, paralysis, or the application of traction). At least two specialists must be available for transporting the patient, and they must take the utmost care to avoid traumatizing the patient.

l. **Special Means Used for Infants and Children.**

(1) The specialist may be required to wheel a small child or an infant in a pediatric crib or a bassinet. When using either of these methods, two specialists may be required, as cribs and bassinets are quite awkward to handle.

(2) Tiny infants may be brought to the OR in an incubator. An incubator (see figure 3-6) is a small crib unit equipped with an inlet for oxygen, a mechanism for supplying heat, and a temperature-regulating mechanism. The incubator is mounted on a wheeled stand. Oxygen may be supplied by means of either a small cylinder or a large cylinder and is piped into the incubator through a tube. If the oxygen is to be kept running during transport, the specialist must check the liter flow gauge both before and during transit.

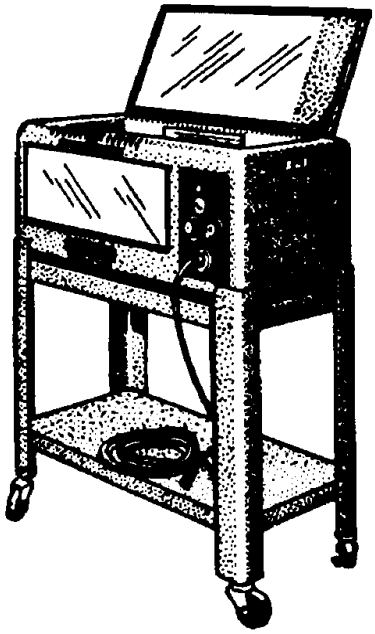


Figure 3-6. Infant incubator.

3-12. THE IDENTIFICATION AND USE OF DRUGS

a. **Discussion.** The improper identification, administration, or use of drugs may endanger the life of a patient. This improper handling of drugs includes such hazards as giving a patient a wrong drug, giving an inaccurate dosage of the right drug, and failing to take appropriate precautions when extremely dangerous drugs (such as phenol and cocaine) are to be used. The specialist may avoid such errors by following the safety rules set forth below.

b. **Reading the Label.** The specialist preparing the drug should read the label on the vial, ampoule, or bottle three times--when taking the drug from its storage place, when ready to pour or withdraw the drug, and just before either discarding the drug

container or returning it to its storage place. If the drug is handed to another person (such as the scrub or doctor), then that person should be shown the label also. The specialist is never to use a drug that has changed color or one from an unmarked or poorly labeled container.

c. **Pouring the Excessive Amount of Drug.** If the specialist pours or withdraws an excessive amount of a drug, he is to discard the excess drug. He is not to return it to the supply container.

d. **Drugs for Use Within the Operative Area.** The label of a drug prepared for use within the operative area is to be checked by two persons. In addition, the specialist states the name of the drug when handing it to the surgeon.

e. **Use of Cocaine.** Cocaine must be kept in a locked place and must be accounted for, since it is classed as a narcotic agent. Cocaine is a highly toxic drug, and therefore, the following precautions should be observed in its use.

(1) Cocaine solution should be stored in a dark bottle away from light and never for duration longer than 2 weeks. The length of storage time will depend upon the surgeon. Many medical officers prefer a freshly made solution each time it is used for topical anesthesia.

(2) Cocaine is never to be injected. It is used for topical anesthesia only.

(3) Dosage should be checked carefully. Cocaine is supplied in ampoules containing either 3.5 g or 0.5 g of the drug and is usually used in solutions of two, four, and ten percent.

(4) Personnel who prepare cocaine solution for use on a patient must be especially careful to ensure that they make no error in the identification of this drug. To assist with the accurate identification of the drug, pharmacy personnel may place a coloring agent into cocaine solution.

3-13. ADMINISTRATION OF BLOOD

Certain safety precautions must be observed when administering blood to a patient to help prevent errors and reactions. The circulating specialist usually assists with the administration of blood.

a. Unless ordered otherwise, the blood is to be kept refrigerated until it is to be administered.

b. The information recorded on the label on the blood container is to be checked against the Standard Form 518, "Medical Record--Blood or Blood Component Transfusion," to be sure the blood is that which is intended for the patient. The container and SF 518 should be checked by a medical officer (usually the anesthesiologist) as well as the circulating specialist before the transfusion is started.

c. Unfiltered blood is never to be given. A blood recipient set, which is equipped with a filter is to be used.

d. The unit of blood is to be rotated gently to disperse the cells evenly. The blood is not to be shaken, as this would damage the red cells.

e. When pressure is being applied to a container of blood to speed the rate of transfusion, the container must be kept under constant observation. As soon as the container has less than a quarter of its total contents remaining, the pressure must be released. These precautions are taken to prevent the occurrence of air embolism, which could prove fatal to the patient.

3-14. SPONGE COUNT

a. **Discussion.** In order to account for all sponges, thus ensuring that none have been accidentally left in the patient, a sponge count is taken at least three times:

(1) By the personnel who wrap sponges or place them in a surgical pack for sterilization.

(2) By the circulator, scrub, and registered nurse (RN) immediately before surgery begins. The circulator then records the sponge count.

(3) By the circulator, the scrub, and RN, and again when the surgeon begins the skin closure. A sponge count may be taken three times during an operation, as in a cesarean section when the sponge count is made before the uterus is closed and again before the abdominal incision is closed, and again as the surgeon is closing the skin. A registered nurse always witnesses the count of sponges in the OR.

b. **Repeating the Count.** There should be no interruptions while the sponge count is being made. If there is any doubt about the count, it must be repeated.

c. **Measures Taken During Surgery.** During surgery, loss of sponges may be prevented by various methods. Measures to be taken by the scrub and the circulator include those listed in ((1)-(2), below). Additional measures may be used depending upon local policy or the preference of the surgeon.

(1) Sponges used for the patient's skin preparation are not radiopaque. The circulator is to remove those sponges from the immediate operative area and to secure them in a conductive bag.

(2) Place stick sponges on sponge forceps for use within a cavity; place Kitner sponges on curved (Kelly) forceps.

3-15. NEEDLE AND INSTRUMENT COUNTS

a. **Accounting for Needles.** The scrub and the surgeon should work cooperatively to make sure that no needle is left in the patient:

(1) Needle counts should be done on a one-for-one basis to the surgeon; that is, the scrub should receive the needle the surgeon has just used before handing him another one. If a needle is broken, both parts must be given to the scrub.

(2) At NO time should there be a free needle (one not on a needle holder) on the Mayo stand or within the operative field.

(3) The scrub should know the number of needles in actual use.

b. **Accounting for Instruments.** Instrument counts are seldom necessary, unless it is common practice to count them in the state where the Army hospital is located or on cases in which instruments might easily be lost.

3-16. CARE OF TISSUE SPECIMENS AND FOREIGN BODIES

a. **Handling of Specimens.** A specimen is anything surgically removed from the patient. It may include bone, soft tissue, or foreign body. The improper handling of specimens may result in a mistaken diagnosis, a delay in treatment, or a second operative procedure, any of which may jeopardize the life of a patient. The circulator is responsible for the proper handling of the specimen. He should take the following measures:

(1) Label the specimen container properly, in accordance with local policy. The circulator must identify the specimen on all the proper forms. A gummed label is usually completed and placed on the specimen container. In addition, Standard Form 515, "Medical Record--Tissue Examination," should be filled out in duplicate.

(2) Place the specimen in the appropriate container with the appropriate solution, usually a ten percent formaldehyde solution for routine specimens. However, the solution to be used is prescribed by the pathologist.

(3) Give special handling to those specimens requiring it. Always ask the OR nurse or the surgeon before placing a specimen in the routine solution. Examples of situations in which specimens may require special handling are as follows:

(a) Some specimens cannot go into the ten percent formaldehyde solution right away. Tissue for frozen section is one example. It is a specimen prepared for immediate diagnosis by quick-freezing, cutting a cell-thick layer, and

viewing under the microscope. When the surgeon requests a frozen section which is usually indicated on the OR schedule, the specialist must be sure that the pathologists has been notified in advance, since the patient is on the OR table under anesthesia while the surgeon waits to hear if the tissue is malignant or benign. There cannot be undue delay! This specimen is placed in a moist towel or a Petri dish, never a sponge, by the scrub and handed to the circulator. He will give it to the designated person, probably someone from the laboratory. It is recorded immediately in the specimen log and signed for upon delivery. It must be delivered immediately to the pathologist. His results will be reported directly to the medical officer or nurse.

(b) Specimens of tissue to be examined for tuberculosis organisms are to be placed in saline solution. In addition, other specimens may be taken to the laboratory in saline solution when the surgeon wants the specimen examined immediately.

(c) When the specimen is a pap (Papanicolaou) smear (done in certain operative procedures to determine the presence of cancerous cells without having to excise tissue), glass slides with secretion from the suspected area are placed in solution of equal parts of ether and dehydrated alcohol (absolute alcohol).

(d) Specimens to be photographed are to be placed in saline solution or covered with a towel moistened with saline because formaldehyde solution discolors tissue.

(e) Some specimens are handled using sterile technique to avoid the possibility of introducing new bacteria. The pathologist's report and in turn the medical officer's diagnosis may be affected if sterile technique was not observed by all personnel when handling the specimen and foreign bacteria were allowed to contaminate it. Cultures are examples of specimens handled using sterile technique. A sterile member of the OR team uses two cotton tip applicators to swab the pus or fluid. When the material has been swabbed for culture, it is passed off to the circulator and should be placed in a culture tube and delivered to the laboratory as soon after being taken as possible.

b. **Disposition of Foreign Bodies.** Foreign bodies removed from a patient should be cared for according to local hospital policy. Such items may have legal significance outside the hospital; for example, police may desire a bullet that has been removed. The giving over of a foreign body to other than the appropriate hospital personnel is done only by the responsible medical officer.

3-17. STERILITY OF MATERIALS

To protect the patient from infection that could prove fatal, measures must be taken to assure the sterility of the materials used. Numerous measures are

employed during the operation to maintain sterile conditions. The OR specialist has many duties in the employment of these measures that include the following:

a. Goods are to be cleaned, wrapped, and loaded in the autoclave (steam pressure sterilizer) in such a way as to facilitate their penetration by steam.

b. Goods are to be processed in the sterilizer at the temperature and for a period appropriate for the item or class of goods and the size of the packages being sterilized.

c. Sterilization indicators are to be placed inside the packs as a check on the sterility of the goods processed. These indicators consist of chemically treated, heat-sensitive paper. If the indicator fails to change color, the specialist will know that the temperature necessary for the sterilization of goods has not been reached inside the autoclave and thus he is to discard the pack as unsterile. If the indicator has changed color, the specialist is to consider the pack safe for use, even though the color change does not provide assurance that the temperature of 250ºF has been maintained long enough for steam to penetrate the depth of the pack. The specialist should be aware of the limitations of sterilization indicators while at the same time realizing their usefulness as a check on the sterility of goods. The method described in g below is used in order to gain absolute assurance of the sterility of autoclave goods.

d. Pressure-sensitive tape is used for sealing and labeling surgical pack wrappers and other items to be processed in the steam pressure autoclave. The paper tape backing changes color when subjected to steam sterilization, giving definite indication that the item has been autoclaved.

e. Upon their removal from the autoclave, packs are to be placed on a perforated surface until they have cooled. This precaution is observed because a condensation of moisture occurs underneath a hot pack when it is placed on a solid metal surface. The pack will absorb this water, thus contaminating the pack since the metal surface is not sterile.

f. The packs are to be dated immediately <u>after</u> they have been processed in the autoclave. This measure prevents confusion as to which packs have been autoclaved.

g. Periodic tests are run to determine whether or whether not autoclaves are actually sterilizing the goods being processed. These tests should be conducted weekly, and in some installations they may be carried out more often. The test is done by placing a <u>bacterial spore test strip</u> (a standard item) inside a large pack. After the pack has been autoclaved, the test strip is removed under sterile conditions, replaced in its packet, and sent to the laboratory. If no growth of organisms occurs within the designated period, the autoclave is sterilizing the goods. If a growth of organisms does occur, the autoclave in which the test strip was processed is <u>not</u> used until it is checked and repaired by maintenance personnel; and the items "sterilized" in that autoclave during the test period are considered unsterile and must be reprocessed and resterilized.

h. All measures necessary for the maintenance of aseptic technique are carried out while an OR is being prepared for an operation and during surgery.

3-18. ACCIDENTS TO OPERATING ROOM PERSONNEL

Serious injury to OR personnel may be prevented if each individual observes the following precautions:

a. Keep the floors free from spilled solutions to prevent falls.

b. Use padding when handling objects that are very hot in order to prevent burns.

c. Use the necessary precautions when handling electrical equipment to prevent shock.

d. Keep your body in proper alignment when moving patients and equipment to avoid back strain and muscle strain.

e. Use adequate support when it is necessary to reach high places. Do not stand upon chairs, fragile boxes, or other items that are not safe for such use.

Continue with Exercises

EXERCISES, LESSON 3

INSTRUCTIONS. Answer the following exercises marking the lettered response that best answers the question or best completes the incomplete statement, or by writing the answer in the space provided.

After you have completed all of these exercises, turn to "Solutions to Exercises," at the end of the lesson and check your answers. For each exercise answered incorrectly, reread the material referenced with the solution.

1. An explosion may result when which of the following combinations of agents is present?

   a. Ether, vinethene, and ethyl chloride.

   b. Oxygen, ether, and nitrous oxide.

   c. Vinyl ether, electrostatic spark, and oxygen.

   d. Flame, tincture of merthiolate, and electrostatic spark.

2. A room for the storage of combustible anesthetic agents is a (an):

   a. Induction room.

   b. Hazardous location.

   c. Anesthetizing location.

   d. Individual OR.

3. As the first step in the preparation of an oxygen cylinder for use, the specialist opens the cylinder valve. In order to observe safe procedure, how much should the specialist open the valve?

   a. Fully.

   b. 3/4 full.

   c. 1/2 full.

   d. Less than any of the above.

4. Which of the following is an appropriate way to operate a soda and acid fire extinguisher?

   a. Open the valve and direct the horn.

   b. Turn upside down and direct the nozzle.

   c. Pump and direct the nozzle.

   d. Open the valve and direct the nozzle.

5. The patient's ward number on the operating room schedule looks like this: a 16B (circled). What does this marking indicate to team members assigned for the operation about the patient?

   a. That is the patient is in the OR.

   b. That the patient has been taken from the OR.

   c. That the patient will not require surgery on that particular day.

   d. That the patient is in the process of being delivered to the operating room.

6. Upon arriving at the surgical suite with a patient you have transported, which of the following persons should you report to?

   a. The OR supervisor.

   b. The surgeon.

   c. The scrub specialist.

   d. The circulating specialist.

7. You have arrived in the OR with the patient and have reported to the appropriate person. How should you mark the patient's nursing unit number on the OR Schedule?

   a. 17A circled with one / over the circle.

   b. 17A circled with an X over the circle.

   c. 17A circled only

   d. 17A circled with an X over the circle plus a vertical line over the X.

8. Why should the coverings over a patient be loosened before the litter is wheeled inside the OR?

   a. To avoid having the patient become too warm.

   b. To lessen airborne contaminants within the OR.

   c. To allow the patient some freedom to move about on the litter.

   d. To facilitate transferring the patient to the operating table.

9. What is the minimum number of times for reading a drug label?

   a. One.

   b. Two.

   c. Three.

   d. Four.

10. An infant is to receive oxygen in an incubator during transit to the operating room. What should you do before starting to wheel the infant?

    a. Turn the oxygen up to the maximum setting.

    b. Check the liter flow gauge.

    c. Adjust the liter flow gauge to 4 liters more than was being given.

    d. Adjust the liter flow gauge to 4 liters less than was being given.

11. After withdrawing a drug into a syringe and removing the syringe from the vial, you see that you have withdrawn more drug than was ordered. What should you do?

    a. Inject the excess drug into the vial.

    b. Administer the drug.

    c. Ask the NCOIC what to do.

    d. Expel the excess drug from the syringe.

12. What is the absolute limit of storage time in weeks after which cocaine solution should not be used?

    a. Two.

    b. Three.

    c. Four.

    d. Six.

13. What method is used to administer Cocaine?

    a. Orally.

    b. Injection.

    c. Topically.

    d. Any of the methods listed above.

14. What solution should specimens be placed in to to test for the presence of tuberculosis organisms?

    a. Ten percent formaldehyde.

    b. Absolute alcohol.

    c. Ether.

    d. Saline.

Check Your Answers on Next Page

SOLUTIONS TO EXERCISES, LESSON 3

1. c (paras 3-4, 3-5a, 3-6a)
2. b (para 3-3a)
3. d. (para 3-7c(4))
4. b (Table 3-1)
5. d (para 3-11c(2)(a))
6. a (para 3-11g)
7. a (para 3-11c(2)(b))
8. b (para 3-11i)
9. c (para 3-12b)
10. b (para 3-11l(2))
11. d (para 3-12c)
12. a (para 3-12e(1))
13. c (para 3-12e(2))
14. d (para 3-16a(3)(b))

End of Lesson 3